DOCUMENT RESUME

ED 210 103 PS 012 540

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TITLE Participant Perspectives of Classroom Discourse. Part II: Why Do You Ask? (Interpretations of the Question Cycle). Final Report.
INSTITUTION California State Univ., Hayward. Research Foundation.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE 31 Jul 80
GRANT NIE-G-78-0161
NOTE 126p.; For related documents, see PS 012 539-544.

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS Academic Achievement; *Classroom Communication; Classroom Research; Communication Research; *Discourse Analysis; Elementary Education; *Elementary School Students; Ethnic Groups; Family (Sociological Unit); Longitudinal Studies; Low Income Groups; Questioning Techniques; *Sociolinguistics; *Student Participation

ABSTRACT

Data on one aspect of a year-long sociolinguistic study of participant perspectives of classroom discourse are presented in this final report. Second-, third-, and fourth-grade pupils in a lower socioeconomic, mutiethnic elementary school viewed videotapes of language arts lessons given earlier in the day. Each videotape was presented in three 4-minute segments. Responses were compared to actual transcripts of the videotapes in order to identify the types of utterances that stood out for participants. Additionally, each pupil was presented with three sets of comments uttered in the lesson; these comments included teacher questions, pupil responses, and teacher praise. Subjects were asked why they thought these comments had been made. Responses to this task provided data on pupil perceptions of the functions of questions, responses, and praise. Pupils' perceptions of the functions of the three elements in the school setting were compared to their perceptions of videotaped family conversations. Among the results was the finding that few significant relationships existed between perspectives of classroom discourse and ethnicity or other variables. Strong relationships existed among pupil perceptions of classroom discourse, participation in class discussions, and academic success. Pupils were alert to the incongruent functions of questions at home and at school. (Author/DB)

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Final Report
Participant Perspectives of Classroom Discourse

Part II:

WHY DO YOU ASK?
(Interpretations of the Question Cycle)

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PS012540

This work was completed pursuant to grant #NIE-G-78-0161, awarded to the Research Foundation, California State University at Hayward, Submitted July 31, 1980.

ABSTRACT

This report presents data on one aspect of a year-long sociolinguistic study of participant perspectives of classroom discourse. The subjects were 165 pupils in six second, third, and fourth grade classrooms in a lower socioeconomic, multi-ethnic elementary school. Six language arts lessons were videotaped in each classroom between September and January. Each lesson was played back in 3 four-minute segments to pupils in the class, on the same day it was taught, and each pupil was asked individually, "What did you hear anybody say in that part of the lesson?" Pupil responses were compared to actual transcripts to provide data on salience of questions, responses, and praise. In addition, each pupil was presented with 3 sets of sentences that had been uttered in the lesson (one of teacher questions, one of pupil responses, one of teacher praise), and asked, "What reason do you think people had for saying these things?" Pupil responses to this task provided data on their perceptions of the functions of questions, responses, and praise.

Category systems were developed to code pupil responses. Nonparametric statistics and regression analyses were used to examine relationships among responses and other variables of interest. Pupil perceptions of the functions of questions and responses in lessons were compared to their perceptions of the functions of these elements in family conversations, as well as to teacher perceptions of the functions of questions, responses, and praise in lessons, and to a sociolinguist's perceptions of the functions of questions in these classrooms.

Findings indicated few significant relationships between pupils' ethnicity and other variables. Classroom language factors were related to pupil perceptions of classroom discourse. There were strong relationships among pupil perceptions of classroom discourse, participation in class discussions, and success in school. Pupils were clearly alert to the incongruent functions of questions at home and at school.

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INTRODUCTION

Background

After many years of studies of verbal interaction in the classroom, one might assume that we know more than we need to know about classroom discourse. We know, for example, that classroom dialogue is asymmetrical, with teachers contributing two-thirds of the language on the average (Flanders, 1970). We know that the question-answer sequence is the most basic pattern of classroom dialogue (Bellack, 1966; Sinclair & Coulthard, 1974) and that it is a pattern that has been found to be stable over fifty years (Hoetker & Ahlbrandt, 1969) and across different countries (Bellack, 1973). We know from research on teacher effectiveness that direct instruction is an effective strategy for teaching basic skills to lower grades, and that the use of factual questions is one important characteristic of the direct instruction method (Rosenshine, 1977; Berliner & Rosenshine, 1976).

We have been told that the question-answer pattern carries different meanings for pupils from different cultural backgrounds (Philips, 1972; Dumont, 1972; Boggs, 1972). We know that teachers characteristically use questions that are not genuine requests for information, but are "test questions" (Labov, 1970), or "pseudo questions" (Barnes, 1969). We also know that the rules of classroom dialogue are quite distinct from those of conversation between social equals (Stubbs, 1976) and that they may act to inhibit children's use of language by setting up a social situation in which children play a passive role, giving short answers to discrete questions, and seldom initiating discussion themselves (Flanders,1970).

We know that the child as speaker has strong effects on the teacher's attitudes and judgments (Williams, 1972: Shamo, 1970; Hammersley, 1974; Wight, 1971, 1975; Leiter, 1974; Mehan, 1974; McDermott, 1974). We know a great deal about the kind of language the child as listener hears in the classroom (e.g., Woods, 1975; Bellack, 1966; Sinclair & Coulthard, 1974). But we know very little about how the child as listener interprets the language of the classroom. What we do know has been largely inferred from a comparison of the child's behavior in school and in other settings (e.g., Houston, 1970; Philips, 1972; Boggs, 1972; Dumont, 1972). The point has been strongly made by sociolinguists that the individual's interpretation of the social situation must be considered if we are to understand the verbal behavior we observe (Hymes, 1972; Stubbs, 1976). This report presents details of a year-long study of pupils' and teachers' perceptions of classroom discourse, and focuses on two major questions of the study, which have to do with interpretations of the functions of questions, responses, and praise and their salience to pupils.

The Problem Under Investigation

The study is one of eight sociolinguistic studies funded by the National Institute of Education, to examine the general problem of causes and effects of inadequate learning of the rules and processes of classroom discourse. The general paradigm that has been used to guide this study is presented in Figure 1. In this model the child's perceptions of discourse at home or at play and at school and his/her participation in classroom discourse are seen as intervening variables between family language factors, or classroom language factors, and eventual success in school. The lines indicate the types of relationships we are examining in the total study. The double lines indicate the relationships to be discussed in this report.

Each of the boxes in this model represents a set of variables. In this report only the variables associated with functions and salience of questions, responses, and teacher praise will be considered. Figure 2 identifies these variables in more detail. Most of these variables are self-explanatory, or will be explicated in the process of reporting on data collection procedures and findings. The variables associated with "success" in school deserve some comment at this point, however.

FIGURE 1

A General Paradigm for Analysis of Participant Perspectives of Classroom Discourse

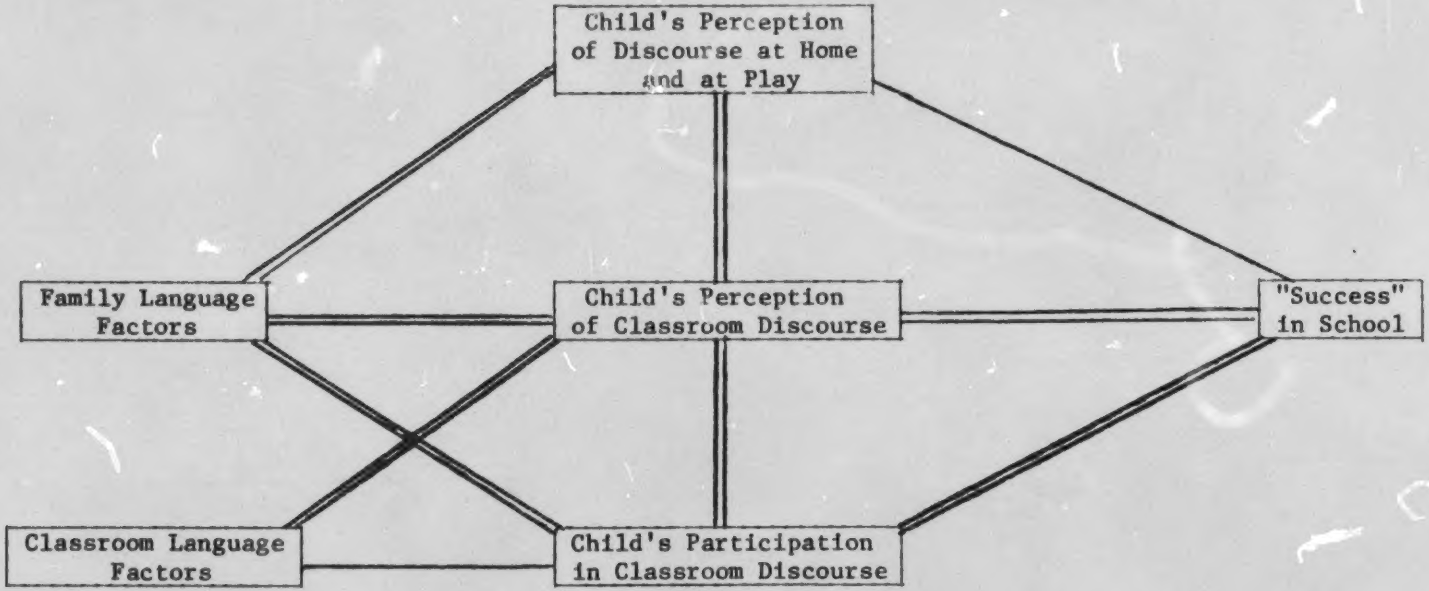
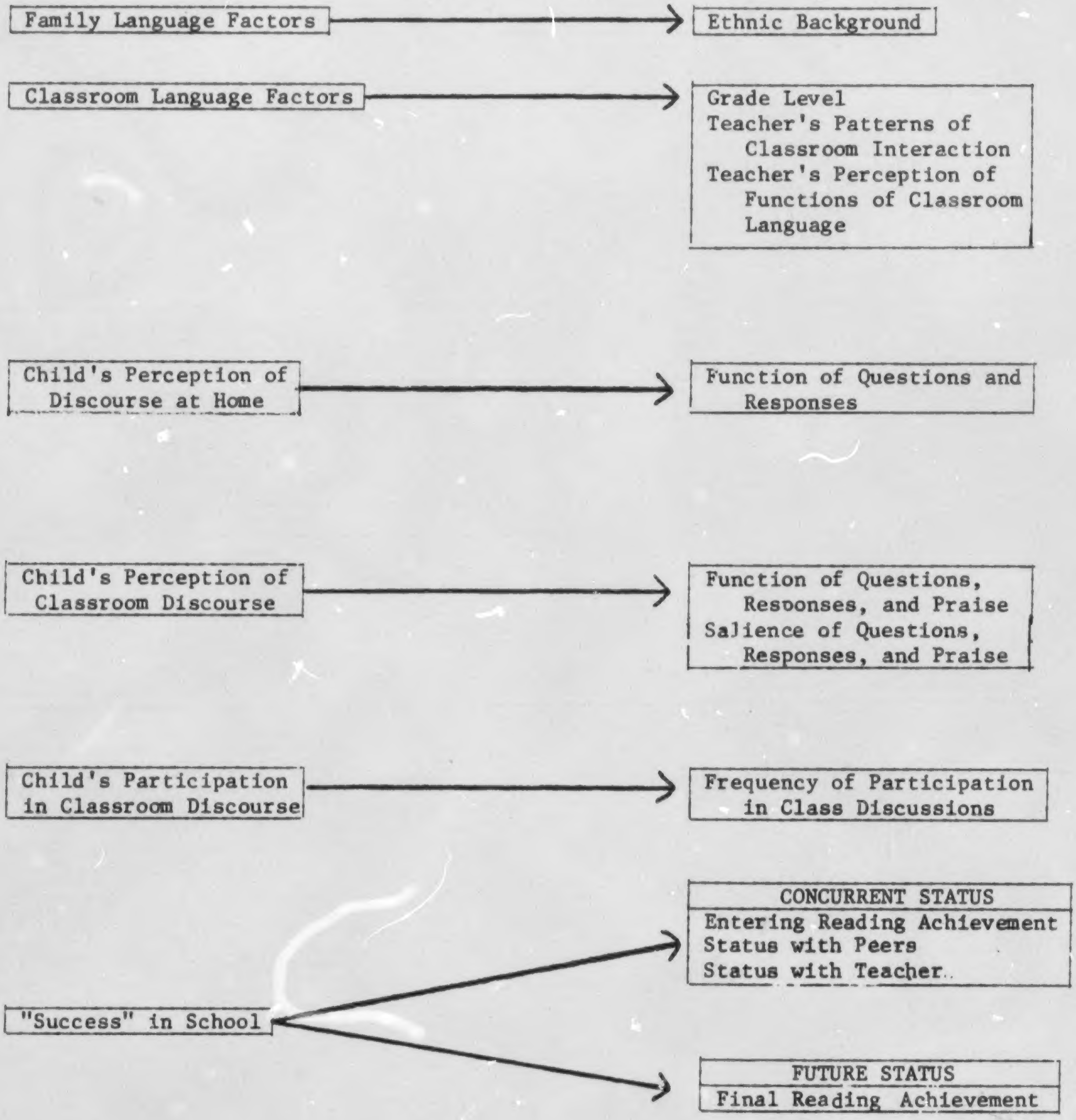

Child's Perception of Discourse at Home and at Play
Family Language Factors
Child's Perception of Classroom Discourse
"Success" in School
Classroom Language Factors
Child's Participation in Classroom Discourse

Figure 2

Identification of Specific Variables Considered in Analysis of Functions and Salience of Discourse


Family Language Factors
Ethnic Background
Classroom Language Factors
Grade Level
Teacher's Patterns of Classroom Interaction
Teacher's Perception of Functions of Classroom Language
Child's Perception of Discourse at Home
Function of Questions and Responses
Child's Perception of Classroom Discourse
Function of Questions, Responses, and Praise
Salience of Questions, Responses, and Praise
Child's Participation in Classroom Discourse
Frequency of Participation in Class Discussions
"Success" in School
CONCURRENT STATUS
Entering Reading Achievement
Status with Peers
Status with Teacher
FUTURE STATUS
Final Reading Achievement

Much of the research on effective teaching has focused on standardized achievement in basic skills as the single criterion of success in school. Furthermore, success is typically defined in terms of "future" status in achievement of basic skills rather than status during the period that the classroom is in operation. It is the end-of-the-year test that is most often used to determine the success or failure of the individual pupil and the effectiveness of the classroom teacher. Entering achievement, which might be termed "concurrent" status, is used mainly as a means of controlling for differential pupil ability to arrive at more accurate estimates of the teacher's contribution to pupil achievement.

A sociolinguistic approach to the study of classroom interaction forces us to acknowledge the importance of concurrent status, and to give equal emphasis to achievement status and status in the social system of the classroom in which the interaction occurs. We have viewed success within the social system in terms of pupil status within the peer group, as well as pupil status with the teacher. From this perspective the highly successful pupil, in terms of concurrent status, is one who achieves well in academic areas, and is highly regarded by both the peer group and the teacher. A very unsuccessful pupil is one who is low achieving, and is also low in peer status and in status with the teacher. Of the 128 pupils in our study for whom all three types of data were available, there were only 17 pupils (13%) who were "very unsuccessful", and 111 pupils (87%) who experienced moderate to high status in one or more areas. Only 11 of these 111 pupils (9.9% of all subjects) were "highly successful." This suggests that success in school is much more widely distributed than we might think if we consider only final academic achievement as a criterion of success. We believe that this kind of expansion of the concept of "success" in school is essential for a clearer understanding of classroom discourse. This expanded concept of success, and relationships among the various status variables, are examined in more detail in Part I of this final report.

Investigative Questions

The major investigative questions addressed in this report are:

1. What do pupils conceive to be the functions of questions, responses, and teacher praise?
   a. Do these vary by grade level or classroom/teacher?
   b. Do these vary by ethnic background, academic ability, or social status in the classroom?
2. What differences do pupils notice between the functions of questions and responses in lessons and in family conversations?
   a. Do these differences vary by grade level or by classroom/teacher?
   b. Do these differences vary by ethnic background, academic ability, or social status in the classroom?
3. How closely do the functions of questions, responses, and praise as conceptualized by pupils correspond to those identified by teachers?
   a. Does the amount of correspondence vary by grade level or by teacher?
   b. Does the amount of correspondence vary by ethnic background, academic ability, or classroom social status of the pupil?
4. How closely do the functions of questions as conceptualized by pupils and teachers correspond to the functions that are identified by a sociolinguistic specialist as operating in these classrooms?
5. Do pupils consider questions, responses, and praise to be salient features of classroom discourse?
   a. Does this vary by grade level or classroom/teacher?
   b. Does this vary by ethnic background, academic ability, or social status in the classroom?

PROCEDURES

Subjects

The subjects of this study are 164 children, and their teachers, in six second, third, and fourth grade classrooms, in a single school located at the southern end of the San Francisco Bay. The six teachers are all female, and all have been teaching for many years. Four are Anglo, one is Black, and one is Portuguese. The school is located in a lower socioeconomic, multiethnic, urban area, consisting mainly of small, single family dwellings. Stable, two parent families predominate, and the school population is also remarkably stable for a lower SES community. About 45% of the pupils are Mexican-American, 35% are Anglo, 11% Black, and 9% other minority groups, including primarily children of Asian and Portuguese extraction. The school appears to us to be remarkably well integrated, with numerous friendship choices that cross ethnic "lines."

While several Mexican-American grandparents, and a few parents, speak only Spanish, most of the Mexican-American parents are at least bilingual, and many speak primarily English. Almost all of the children we worked with were reasonably fluent in English. There is community interest in maintaining the Mexican-American culture in the family, but parents are also actively interested in having their children succeed in the American school culture.

Data Collection Procedures

The basic data collection procedure for this study involved videotaping six language arts lessons in each classroom over the first half of the school year (September through January). Teachers selected their own content for these lessons. We specified only that they not teach spelling or handwriting, and that the lessons should include the whole class and should involve some verbal interaction (i.e., not be comprised merely of individualized seatwork). The lessons covered a variety of topics (e.g., capitalization, nouns, poetry analysis, creative writing) and a variety of activities (e.g., pantomime, sensory awareness exercise, textbook exercises).

The videotaped lessons were played back to pupils and teachers on the same day that they were taught. Each pupil viewed three different lessons, working individually with a data collector, and responding to a variety of data collection tasks. Each teacher viewed all six lessons, and responded to the same set of data collection tasks as did the pupils. Videotapes of conversations in three families (one Anglo, one Mexican-American, and one Black) were used to collect information on perceptions of discourse at home. Within each classroom a stratified (peer status and sex) random sample of six students was videotaped in an indoor, relatively unstructured play setting, and these videotapes of play group conversations were used to collect information on perceptions of discourse at play.

Salience of questions, responses, and praise. In videotape playbacks of the language arts lessons each pupil worked individually with a researcher. Five pupils and five researchers sat in pairs around a classroom, spread out so that they would not overhear each other. In the front of the room was the television monitor. Approximately twelve minutes of each lesson had been tape recorded, including portions of the opening, middle, and closing of the lesson. The videotape was played back in three segments of about four minutes each. After each segment, the researcher asked the pupil with whom (s)he was working, "What did you hear anybody saying in that part of the lesson?" The pupil's response was printed verbatim on a 3 x 5 card, and the researcher then asked, "What else did you hear anybody saying in that part of the lesson?" This continued until the child could think of no more responses. The next tape segment was then played, and the procedure repeated, until all three segments had been played. At the end of the day the videotape was played back for the teacher, and the same porcedure was followed with her.

At a later point in time a transcript of the videotaped lesson was prepared, and pupil and teacher reports of what they heard being said in each lesson were compared to what had been recorded, to identify the types of classroom language that appeared to stand out to participants.

Functions of questions, responses, and praise. Several different tasks were designed to collect information on children's perceptions of form/function relationships in school, home, and play settings. In one task, a set of several questions that had been asked by the teacher during the lesson was presented to the pupil after the videotape playback of the October/November lesson. Each question was printed on a 3 x 5 card. The cards were placed in front of the pupil, and read aloud. The data collector said, "These are all things that I heard someone saying in the lesson. Who do you suppose said these things? Who do you think they were talking to? Why do you think they said these things? What do you suppose their reason was?" Children's responses were recorded. The same general procedure was followed with a set of pupil responses to questions that had been given during the lesson. Examples of the questions and responses used in this task are presented in the appendix to this report.

After playback of the videotape of family conversations, the same procedure was followed with a set of questions and responses that occurred during these conversations. This procedure was also followed after viewing of the videotapes of play group conversations, but was not found to be very effective in this instance. Very few question forms were used by children in the play group settings, and those that were used tended to serve an attention-getting function rather than an information-getting function. The data on children's perceptions of the functions of these questions and responses were therefore not really comparable to the data on their perceptions of the functions of questions and responses in lessons and in family conversations. A special analysis of the language that occurred in the play group settings will be presented in a subsequent report (Part V of the final report).

In a similar task, a set of praise statements that had been made by the teacher during the lesson was presented to the pupil after the videotape playback of the January lesson. Each statement was printed on a 3 x 5 card. The cards were placed in front of the pupil, and read aloud. The data collector said, "These are all things that I heard someone saying in the lesson. Who do you suppose said these things? Who do you think they were talking to? Why do you think they said these things? What do you suppose their reason was?"

Children's responses were recorded. This task was not repeated after playbacks of the videotapes of family conversations or play group conversations. Only one instance of praise occurred in the family videotape, and instances of praise were also rare in the play group videotapes. Examples of the praise statements used for this task are also included in the appendix to this report.

Each of the classroom tapes were viewed by teachers as well as pupils, and teachers responded to the same tasks on the functions of questions, responses, and praise as did the pupils. In addition, these videotapes were viewed by a sociolinguistic specialist, who analyzed the patterns of discourse within each classroom.

Additional data. Videotapes of the lessons were used to produce transcripts of each class discussion, and seating charts provided by the teacher were used to identify the pupil who made each comment, wherever possible. These data were used to derive a measure of frequency of participation in discussion over six lessons for each pupil, and within each classroom pupils were classified as high, middle, or low in frequency of participation, based on the overall patterns of participation in that class.

To gather information on pupil status in the peer group, each child (in January) was presented with an array of photographs of children in the class, given a series of scenarios, and asked to select the three children most likely and least likely to fit each scenario. The episodes involved selection of a team for a sports contest, selection of a team for a TV quiz show, identification of the children who would be likely (or unlikely) to take charge and know what to do if there were an accident in the classroom and no adults were around, and identification of the children who would probably be observed "hanging around" with the pupil if he/she were followed for a week. Composite scores were developed for each pupil according to how frequently he/she was mentioned under "most likely" and "least likely" categories, and within each classroom pupils were classified as high, middle, or low in peer status, on the basis of these composite scores.

Data on pupil status with teachers were collected by asking teachers to group children on the basis of several different language characteristics, which had been identified in earlier studies as salient features to teachers (Morine-Dershimer, 1979; Morine & Vallance, 1975). In September, October, and December teachers were presented with a set of 3 x 5 cards, each containing the name of a pupil in their classroom, and asked to sort, or group, the pupils according to: their participation in class discussions; their attentiveness during lessons; their tendency to follow the "no-talking" rules of the classroom; their use of "standard English;" and their probability of success in reading achievement for the year. (Some teachers in this study declined to group students on the basis of use of standard English, saying that all of the children in their classes spoke standard English, whatever that was, although in fact there was fairly wide variance in pupils' use of what many would consider correct grammar or usage.) Teachers' groupings of pupils in December, when the classroom was well established, were used to develop composite scores of their ratings of pupils, and within each classroom pupils were classified as high, middle, or low in status with the teacher on the basis of these composite scores.

Pupil "entering" reading achievement scores were based on the results of the Metropolitan Achievement Test which was routinely administered by all teachers in the school in October. Within each classroom these scores were organized by quartiles, based on the national test norms, since the state-funded reading improvement program in the school was evaluated on the basis of the number of pupils who moved up from below the first or second quartile in reading achievement during the course of the school year.

"Final" reading achievement was measured by scores on the Metropolitan Achievement Test which was administered in the fall following our year of data collection. In examining the factors that might be related to final achievement, we have used regression analysis to control for entering reading achievement.

Data Analysis

For each task administered, pupil responses were reviewed and category systems were developed to reflect the pattern of these responses. These category systems are described briefly in the section on findings, and are presented in greater detail in the appendix to this report. Intercoder reliability in use of these category systems was checked by having two separate coders code all responses for one or more classes. In all cases agreement was above .90.

When all pupil responses had been coded, these data were combined with background information on pupils (ethnic group, grade level, classroom, etc.) and the SPSS and SAS computer programs were used to identify general patterns of responses, as well as relationships between patterns of response and other pupil variables.

In addition, pupil responses were compared across the two settings of home and school, and within the school setting, the pupil responses were compared to those of their teachers. The patterns of participant perceptions within each classroom were compared to the descriptions of the sociolinguistic specialist, following a method of "triangulation" recommended by Adelman and Walker (1975).

Most of the variables examined in this paper are qualitative, or have been treated as qualitative in order to make comparisons across classrooms. A variety of nonparametric statistics have been used to test the significance of relationships. Regression analyses (performed by the SAS computer program) have been used to identify the factors that contribute to status with teacher, participation in class discussions, and final reading achievement. (See appendix for details on statistical procedures.)

It should be noted that this is an exploratory study, and that a large number of relationships have been examined. The reader is reminded that significant relationships which have been identified must be viewed conservatively for this reason.

FINDINGS

A Sociolinguist's Perception of The Function of Questions in Lessons

The sociolinguistic specialist who consulted on this part of the study was Roger Shuy of Georgetown University and the Center for the Study of Applied Linguistics. In analyzing the functions of questions in these six classrooms, Shuy sampled only the first two lessons videotaped in each class. These lessons were all videotaped during the first four weeks of school in September, and therefore reflect only classroom language patterns that occurred during the time that teachers were concentrating on getting the classroom routines established. Shuy's analysis of teacher questions during this period is presented here in toto, (with an occasional "Editor's Note," added by Morine-Dershimer) and forms the remainder of this particular segment of the report.

Hugh Mehan (1979) has pointed out that the major interactional sequence in classroom talk is the three-part exchange between teacher and student:

1. Teacher initiation;
2. Student response;
3. Teacher evaluation.

The twelve lessons analyzed here support Mehan's observation. By far the majority of teacher student exchanges are, in fact:

1. Teacher question;
2. Student response;
3. Teacher evaluation of student response.

The study of question-asking strategies in these classrooms can be approached from several perspectives.

It is instructive, for example, to display the ratio of questions to the total number of utterances by each teacher (see Table 1). An utterance is defined here as any sentence segmented unit produced by a teacher (question, statement, exclamation, etc.). Of the 1,952 utterances initiated by the teachers

Table 1

Relationship of Questions to Total Number of Utterances, by Individual Teacher

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F	Totals
Number of Questions	51	123	60	130	102	131	597
Number of Utterances	172	343	345	347	338	407	1952
Ratio of Questions to Utterances	1:3.4	1:2.8	1:5.8	1:2.7	1:3.3	1:3.1	1:3.3
Ratio of Content Questions to Utterances	1:9.6	1:3.0	1:8.8	1:3.5	1:4.2	1:4.5	1:4.4

in this sample, 597 were questions, yielding an average of one question per 3.23 teacher utterances (ratio of 1:3.3). There are many teacher utterances in these lessons, however, which have the form of questions but which actually function as directives. The following examples are illustrative:

> Do you want to try, Mike?
> Can you read them with me?
> Will Kim come up to the board?

These sentences are actually directives to the students, softened by their question form. What they actually mean is:

> Please recite, Mike.
> Read with me.
> Come to the board, Kim.

Since these utterances do not actually function as questions, they should not be counted as questions here. Likewise, when teachers ask students to repeat their utterances (Beg pardon? Would you repeat that?), it is unwise to consider these as the same kinds of questions as others.

If we deduct these directives and requests for repetition and consider only "content" questions, the ratios shift to those presented on the last line of Table 1.

In a sample of one third of the thirty-six lessons taped in this study, it was possible to find only 67 student-initiated exchanges, all of them questions. This represents three percent of the total of initiations in these classrooms, the other 97 percent being by teachers.

It is apparent, then, that of the talk which takes place in these classrooms, a great deal of importance is placed on questions. The remainder of the teacher utterances were about equally divided between evaluation of student responses to the teachers' questions and various introductory remarks and directives. A teacher whose classroom talk centers on management (e.g., Teachers

A and C) are less likely to have a high ratio of questions simply because the time is spent on other things.

Questions are used by the teachers in this study quite differently. The lessons under observation tended to contain four parts:

1. Attention;
2. Focus;
3. Process;
4. Transition

By attention I mean only how the lesson is begun. Introduction is not an equivalent since, in many cases, the lesson topic is never introduced. Instead the lesson only begins with a call to attention. Attention, then is a category which is broader and more general than introduction but which serves better to describe what is there. Focus is the main part of the lesson as perceived by the teachers' own words and by structural clues such as change of intonation, pacing, and voice quality. This is the part of the lesson where presumed new information is presented, often introduced with a question such as "What is a sentence?" By process I mean the metacognitive phase in which the teacher leads the students to know how they know what they know. Since lessons do not always conclude, I use the term transition out to signal the wind-down of the lesson. Often this is little more than the management task of closing the book or moving to another part of the room. It can also be signaled by the performative, "That ends our lesson on adjectives." It clearly transitions out but does not necessarily conclude.

A mere tabulation of the questions asked per part of the lesson is not particularly instructive, but here again both teachers A and C pattern differently from Teachers B, D, E, and F. For teacher A one ninth of her questions frame the lesson in the attention and transition out parts. Teacher C has no questions in either of these lesson parts. Teachers B, D, E and

F maintain a fairly consistent ratio of one fifth of their questions in these two parts of the lesson.

It is only by examining the types of questions used, however, that interesting patterns of the ways in which talk is used can be noted. In order to show this it will be necessary to first distinguish question probing from question socializing. The demands of the classroom seem to require that every child "get a chance" to respond. This is not a bad thing, of course, but it runs counter to the teacher's need to determine what a child knows. Probing to find out what an individual learner knows can be done most efficiently in a one-to-one situation. Since the time and number constraints of the classroom prohibit such probing most of the time, teachers are faced with the paradox of probe shifting to a group of children.

Within the constraints of such probing, however, certain patterns can be seen within the six teachers observed here. In order to determine these patterns, it is first necessary to delimit the kinds of questions available to each teacher. Open-ended questions are the best indicators of what a student knows since such questions do not set limits on the expected answer, yielding a self-generated rather than a teacher-influenced response. The form that the open-ended question can take is varied but its function is what really matters. That is, the initiation, "Tell me about the industry of Bolivia" appears to be an imperative in form but it actually functions as an open-ended question. Likewise a wh-question of the type which elicits a large territory answer such as "What do you know about Bolivia?" can serve as a self-generating open-ended question even though wh-questions are usually thought to be specifying. Even a yes-no question, such as "Could you tell me all about Bolivia" actually functions as an open-ended question if the expected answer is more than a _yes_ or a _no_.

Wh-questions, as indicated above, tend to reduce the self-generation potential of a response by focussing more narrowly than the open-ended question, (for example, "What is the leading export of Bolivia?) Yes-no questions reduce self-generated answering even more by requiring only a yes or no response to such questions as "Is tin the leading export of Bolivia?" Here the students have a 50 percent chance of being right whether or not they know the answer. Finally, the tag question actually influences the students' answers in the way the questioner desires, and limits the possibility of being wrong to very low odds (for example, "Tin is the leading export of Bolivia, isn't it?"). Figure 3 describes the usefulness of such a range of questions, with regard to the probing function.

In good probing (only one of the possible reasons for asking questions) teachers will move down the figure from open-ended to wh- to yes-no to tag questions. Poor probing may dwell on yes-no and tag questions. On the other hand the function of questioning which grows out of the egalitarian idea that "every child should get a chance" might well use tag questions as a way of involving even the most reluctant or ill-informed pupils. Still another reason for questioning is also apparent in teacher talk--that of priming the pump. In their question-asking strategies, teachers will sometimes ask a question which will not really probe knowledge, in order to get the children to offer positive responses for whatever psychological benefit this may offer them.

Table 2 presents the question-asking patterns of the six teachers in this study, viewed from the perspective of the probing function. What is immediately apparent is that no open-ended questions were asked in this sample of lessons in the opening weeks of school. Teachers B, C, D and E asked proportionately more wh- than yes-no questions, while teachers A and F reversed this.* Teacher F., who in other respects is more conversational in her teaching style, also uses a relatively high percentage of tag questions. These cases are not usually to probe, however. They are conversational support devices.

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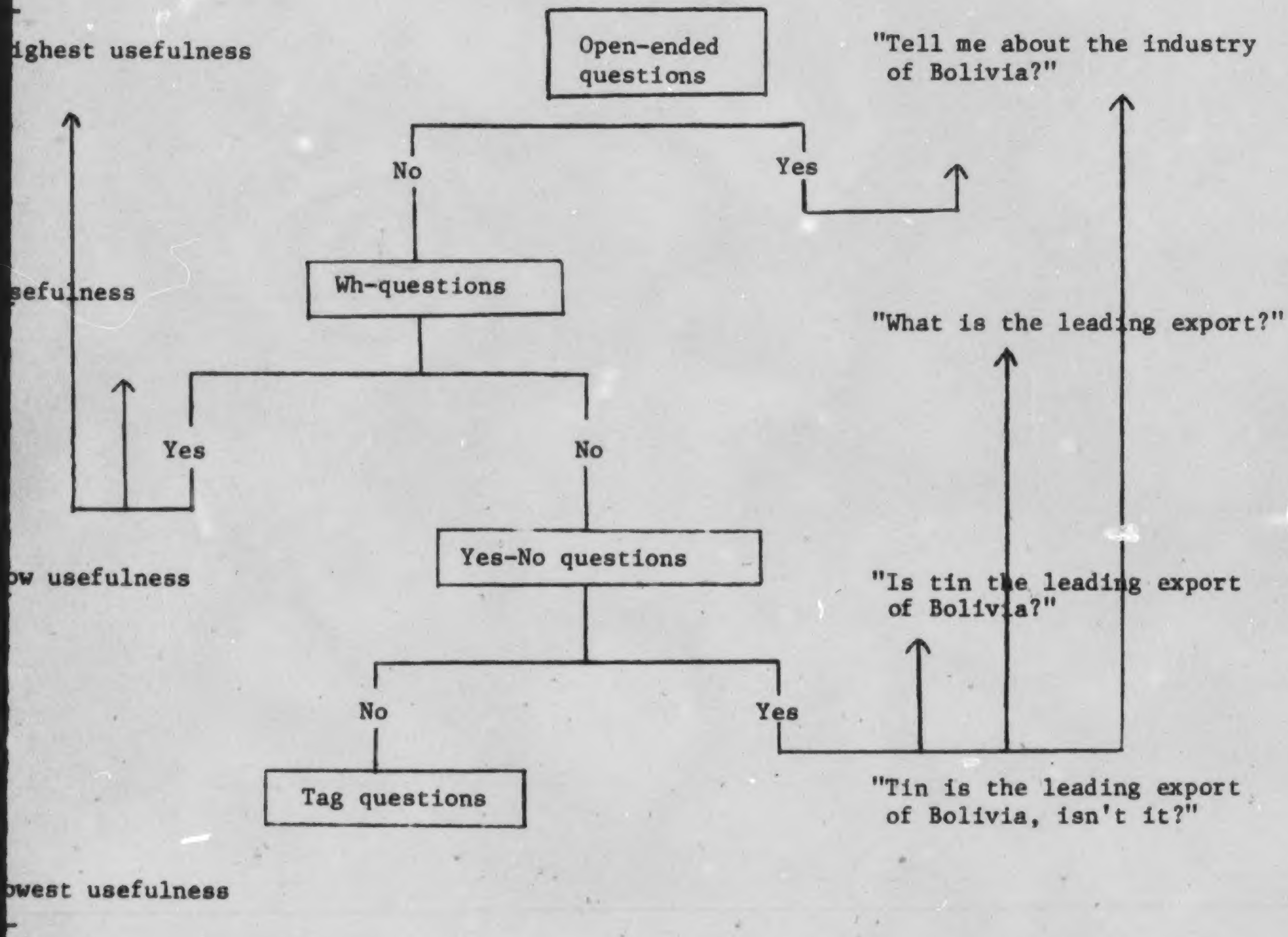
* (Editor's Note: These proportional differences are most marked for Teachers B and E, and quite minimal for Teachers D and F.)

Figure 3

Relative Usefulness of the Answers to Four Types of Probe Questions


ighest usefulness
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Open-ended questions
No
Yes
"Tell me about the industry of Bolivia?"
Wh-questions
"What is the leading export?"
Yes
No
Yes-No questions
"Is tin the leading export of Bolivia?"
No
Yes
Tag questions
"Tin is the leading export of Bolivia, isn't it?"

Table 2

Types of Questions Asked by Each Teacher
(Percent of Total Questions)

Type of Question	Teacher A (N=51)	Teacher B (N=119)	Teacher C (N=60)	Teacher D (N=130)	Teacher E (N=102)	Teacher F (N=131)
Open-ended	0	0	0	0	0	0
Wh-	40	60	54	36	72	35
Yes-No	55	26	32	30	26	40
Tag	0	0	9	4	0	14
Other*	5	14	5	30	2	11

* "Other" includes statements used as questions, hesitation markers, and questions, such as OK?

Noteworthy here is the fact that the sequence of questioning used by all six of these teachers seldom follows the downward flow of question probing represented in Figure 3. It would seem possible, even in the lower elementary grades, for teachers to probe sequentially. The following hypothetical conversation can serve as an example:

Q: What did you do yesterday, Johnny? (Open-ended and broad wh-)

A: I don't remember.

Q: What were you doing outside? (wh-, narrow)

A: I don't know.

Q: Did you chase something? (yes-no)

A: I don't remember.

Q: Well, you did chase Fido, didn't you? (tag)

Since the classroom seldom offers the opportunity to ask Johnny four straight probe questions, we find in our lessons a great deal of question horizontality rather than verticality. Teacher C, for example, tends to ask the same question type over and over. On two occasions she asked five straight wh- (how) questions. On another occasion she asked six straight wh- (how) questions. Teacher D once asked seven consecutive yes-no questions and on another occasion she asked nine straight wh- (what) questions.* In contrast, Teachers B and F tend to vary their question types considerably, much more in keeping with the variation in question types found in natural conversation. The impression given by the tendency of Teachers C and D to repeat the same question type over and over again (referred to earlier as horizontality) may well be a product of their effort to make school sound like school.

It is also instructive to examine the use of question types within the parts of the teachers' lessons (attention, focus, process and transition out). Wh- questions dominate overall in the attention parts (2 to 1) but are only even with yes-no questions in the transition-out parts. Of more interest is the contrast between wh- and yes-no questions in the focus and process parts of the lessons. Wh- questions dominate two to one in the focus sections but five to one in the process parts. Despite these ratios, only Teachers D and E have clearly dominating ratios of wh- to yes-no questions (4 to 1). Teachers B and F show an even ratio of wh- to yes-no questions,while for Teachers A and C, yes-no questions dominate 2 to 1 in the focus part of the lesson.

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* (Editor's Note: Teacher E repeats the same question over and over, asking several different pupils to respond in turn.)

It has been mentioned that probing questions are made difficult by the social function of the question in a participatory democracy. Despite these almost contradictory forces, Teachers B, D, E and F tend to move from wh- to yes-no in a somewhat loose pattern, giving recognition, at least, to the probing flow presented in Figure 3, while Teachers A and C, as is often the case, follow a different pattern.

Summary. Shuy's report on his perceptions of the functions of questions in the language arts lessons of these six teachers during the opening few weeks of school concludes with the above paragraph. The main points of his report are summarized briefly here, before we turn to examine the perceptions of the pupils and teachers who were participants in those lessons. The main points are:

1) Questions are an important part of classroom talk in these lessons, comprising approximately one out of every three teacher utterances;
2) The majority of questions are asked in the "focus" and "process" portions of the lessons, with one fifth or less of the questions occurring in the "attention" and "transition out" portions;
3) The questions asked in these lessons do not follow the proposed model of an effective probing strategy (i.e., moving from an open-ended question to a wh- question to a yes-no question to a tag question);

4) The flow of questions in these lessons does not follow the vertical downward movement of the proposed model, but appears to be more horizontal (i.e., a series of wh- questions are asked before proceeding to a yes-no question);

5) Teachers in these lessons use mostly wh- questions and yes-no questions, with only two of the six teachers showing a strong predominance of wh- over yes-no questions; and

6) Wh- questions tend to dominate five to one over yes-no questions in the process parts of the lessons, but teachers differ greatly here, with two teachers (D and E) having a strong four to one dominance of wh- questions, two teachers (B and F) using wh- and yes- no questions in about equal amounts, and two teachers (A and C) using yes-no questions twice as often as wh- questions.

Pupil and Teacher Perceptions of the Function of Questions and Responses

Before examining the findings on pupil and teacher perceptions of the function of questions and responses in lessons, it is important to note again that our sociolinguistic consultant chose to sample only the lessons from the opening weeks of school in making his analysis. Pupils and teachers, on the other hand, reported on the function of questions and responses in lessons that were taught in October/November, when classroom routines were established. It is also worth noting that Shuy's analysis examines the functions of questions in relation to a proposed model of effective questioning, while the categories of question functions that are presented in the next section were developed to reflect the ideas expressed by pupils. Despite these differences, it is possible to make some interesting comparisons between the sociolinguist's perceptions and the participants' perceptions, and we will comment on these from time to time in the sections that follow.

General patterns: questions and responses in lessons. The general patterns of performance on the task of defining the functions or purpose of questions and responses in lessons are presented in Table 3. Note that the most frequent pupil comments suggest that classroom questions are asked because the teacher wants to tell, or teach, while responses are given because the teacher asked a question. This suggests that many children are well aware of the phenomenon of the "psuedo-question." It is also the case, however, that 10 percent of the pupils said that classroom questions had been asked because the teacher wanted to know, and over 21 percent said that responses were given because pupils wanted the teacher or the class to know. At least some pupils do believe that classroom questions and responses serve a typical conversational function. It is also the case that only 7.1 percent defined questions as serving a probing function (Teacher wants to know what pupils know), and only 3.2 percent thought that responses were given because pupils wanted teachers to know that they know.

It may be somewhat disconcerting to educators to see that over 16 percent of the children in this study could give no reason why their teachers asked the questions that had been asked in the lesson, and almost 15 percent could give no reason for pupil responses that were given. Over 14 percent of the pupils attributed pupil responses to the teacher. This may be explained in part by the fact that several of the teachers did tend to repeat pupil responses very frequently, so that in fact many of the responses that pupils gave *were* said by the teachers as well. Table 3 is organized to emphasize the coordinated definitions that children gave (e.g., questions are asked because the teacher wants to know, and responses are given because the pupil wants the teacher to know). The percentage figures, however, demonstrate that while the definitions given provide the possibility of coordinated functions, the children did not tend to respond as if there were in fact relationships between functions of

Table 3

General Patterns:

Pupil Definitions of the Functions of Questions and Responses in Lessons

Functions of Questions Reported (N=155)			Functions of Responses Reported (N=155)		
Teacher wants to know	16	(10.0%)	Pupil wants teacher to know	25	(15,6%)
Teacher wants pupils to think	5	(3.2%)	Pupil wants class to know	9	(5.8%)
Teacher wants to tell/teach	56	(36.0%)	Pupil wants to learn	6	(3,9%)
Teacher wants to know if pupils know	11	(7.1%)	Pupil wants teacher to know they know	5	(3.2%)
Teacher wants to get an answer	18	(11.6%)	Teacher asked a question	45	(29.2%)
"That's just what we're doing"	9	(5.8%)	"That's just what we're doing"	5	(3.2%)
Other, unique responses	7	(4.5%)	Other, unique responses	15	(9.7%)
No reason given	25	(16.1%)	No reason given	23	(14.9%)
Questions attributed to pupils	8	(5.2%)	Responses attributed to teacher	22	(14.3%)

questions and responses (e.g., 34.8 percent said questions were asked because the teacher wanted to tell or teach; while only 3.9 percent said responses were given because the pupil wants to learn). This fact is examined further in Table 4, where responses are collapsed into four major categories: Informative (Teacher wants to know, Teacher wants pupil to think; Pupil wants the teacher or class to know); Instructional (Teacher wants to tell/teach, Teacher wants to know what pupils know; Pupil wants to learn, Pupil wants teacher to know that (s)he knows); Routine Interactive (Teacher wants an answer, That's what we're doing; Teacher asked a question, That's what we're doing); and No Codable Function (Other, unique responses, No reason given, Questions attributed to pupil, Responses attributed to teacher). Only 5 percent of the pupils saw classroom questions and responses as serving a coordinated Informative function; 5 percent saw them as serving a coordinated Instructional function: 10 percent saw them as serving a coordinated Routine Interactive function; and 15 percent could give no codable function for either questions or responses. The most typical "uncoordinated function" reports were that questions are asked because the teacher wants to tell or teach, while responses are given because the teacher asked a question (14 percent), or because the pupil wants the teacher or the class to know (12 percent).

Table 5 compares pupil and teacher perceptions of the functions of questions and responses in lessons, and it is clear that in general teachers and pupils define response functions in similar ways, i.e., they are either for informative or routine interactive purposes. However, teachers reported that their questions served informative and interactive functions as frequently as instructional functions, and in this they differed from pupils' emphasis on the instructional function. Teachers did tend to report coordinated functions more

TABLE 4

Pupil Perceptions of the Coordination of Functions for Classroom Questions and Responses

(N=155)

Functions of Responses	Functions of Questions			
	Informative	Instructional	Routine Interactive	No Codable Function
Informative	8 (5%)	19 (12%)	3 (2%)	4 (3%)
Instructional	3 (2%)	7 (5%)	0 (0%)	1 (1%)
Routine Interactive	3 (2%)	22 (14%)	15 (10%)	11 (7%)
No Codable Function	7 (5%)	19 (12%)	9 (6%)	24 (15%)

TABLE 5

A Comparison of Pupil and Teacher Perceptions of the Function of Questions and Responses in Lessons

	Question Functions Reported		Response Functions Reported	
Type of Function	Pupils (N=155)	Teachers (N=12 lessons)	Pupils (N=155)	Teachers (N=12 lessons)
Informative	21	4	34	4
Instructional	67	4	11	2
Routine Interactive	27	4	50	6
No Codable Function	40	0	60	0

frequently than pupils. For eight of the twelve lessons in which teachers defined the purposes of questions and responses, questions and responses were reported to serve coordinated functions (3 were Informative, 1 was Instructional, and 4 were Routine Interactive).

General patterns: questions and responses at home. The general patterns of performance on the task of defining the function of questions and responses in family conversations are presented in Table 6. It is clear that the major reason for questions here is that the parent wants to know, while the two major reasons for responses are that the child is "just telling," and that the child wants the parent to know. Questions and responses are definitely perceived as serving more conversational functions at home than at school. It is worth noting, however, that over 10 percent of the children could give no reason for questions being asked in this setting, while 18 percent could give no reason for responses.

Pupil perceptions of the coordination of functions of questions and responses are examined in Table 7, where responses are collapsed into four major categories: Informative (Parent wants to know, Child wants parent to know); Influencing (Parent wants to tell, Child wants parent to do something); Routine Interactive (Parent is asking, or Just talking, Child is just telling, and "That's what happened"); and No Codable Function (Unique responses, No reason given, Questions attributed to children, Responses attributed to parents). Even in the home setting, only about 25 percent of the children define questions and responses in terms of coordinated functions (16.5 percent Informative, and 8.2 percent Routine Interactive). Almost 15 percent still do not identify codable functions for either questions or responses. The most typical response (24.1 percent) is the "uncoordinated" perception that questions are asked because parents want to know, and responses are given because children are "just telling."

TABLE 6

General Patterns:

Pupil Definitions of the Function of Questions and Responses in Family Conversations

Functions of Questions Reported			Functions of Responses Reported		
(N=158)			(N=158)		
Parent wants to know	88	(55.7%)	Child wants parent to know	34	(21.5%)
Parent wants to tell	1	(.6%)	Child wants parent to do something	18	(11.4%)
Parent is asking	18	(11.4%)	Child is just telling	46	(29.1%)
Parent is just talking	5	(3.0%)	"That's what happened"	16	(10.1%)
Other, unique responses	13	(8.2%)	Other, unique responses	15	(9.5%)
No reason given	16	(10.7%)	No reason given	27	(18.1%)
Questions attributed to children	17	(11.3%)	Responses attributed to parents	2	(1.3%)

TABLE 7

Pupil Perceptions of the Coordination of Functions for Questions and Responses in Family Conversations

(N=158)

	Functions of Questions			
Functions of Responses	Informative	Influencing	Routine Interactive	No Codable Function
Informative	26 (16.5%)	0 (0%)	3 (1.9%)	5 (3.2%)
Influencing	8 (5.1%)	0 (0%)	2 (1.3%)	8 (5.1%)
Routine Interactive	38 (24.1%)	1 (1%)	13 (8.2%)	10 (6.3%)
No Codable Function	16 (10.1%)	0 (0%)	5 (3.2%)	23 (14.6%)

Congruency between home and school. Given the differences in patterns of responses in defining the functions of questions at home and at school, we should not expect to find very much congruence in children's perceptions of the two settings, and indeed there are very few children who perceive the two settings in similar ways. Table 8 presents a comparison of pupil-perceived functions of questions in lessons and in family conversations. Only 19 children out of 147 (12.9 percent) defined questions as serving similar functions in both settings (17 as Informative and 2 as Routine Interactive). Most children saw question functions as incongruent in the two settings, with 39 (26.5 percent) identifying them as Instructional at school and Informative at home. Seventeen children (11.6 percent) did not give a codable function for questions in either setting.

Table 9 presents a comparison of pupil-reported functions for responses in lessons and in family conversations. In this case 25 children out of 149 (16.8 percent) perceived the functions as congruent in the two settings (7 as Informative, and 18 as Routine Interactive). Most children gave incongruent definitions for the functions of responses in the two settings, with 15 (10.1 percent) reporting them to be Informative at school and Routine Interactive at home, and 11 (7.4 percent) reporting them to be Routine Interactive at school and Informative at home. Twenty-one children (14.1 percent) did not give a codable function for responses in either setting.

Summary of general patterns. The general results for the task of defining the functions of questions and responses in lessons and in family conversations seem to indicate that many children are aware of the very real differences in the functions of questions in the two settings. They tend to perceive questions as serving an Informative function at home and an Instructional function in lessons. The principal Instructional function of lesson questions is perceived to be one of telling or teaching, rather than one of probing, or diagnosing what is already known. Pupils tend to see responses, however, as serving a Routine Interactive function in both home and school settings. Most children

TABLE 8

Congruency of Pupil Perceptions of Question Functions in Lessons and in Family Conversations

Functions in Family Conversations	Functions in Lessons			
	Informative	Instructional	Routine Interactive	No Codable Function
Informative	17 (11.6%)	39 (26.5%)	19 (12.9%)	9 (6.1%)
Influencing	0 (0%)	1 (.7%)	0 (0%)	0 (0%)
Routine Interactive	2 (1.4%)	5 (3.4%)	2 (1.4%)	9 (6.1%)
No Codable Function	2 (1.4%)	21 (14.3%)	4 (2.7%)	17 (11.6%)

TABLE 9

Congruency of Pupil Perceptions of Response Functions in Lessons and in Family Conversations

Functions in Family Conversations	Functions in Lessons			
	Informative	Instructional	Routine Interactive	No Codable Function
Informative	7 (4.7%)	4 (2.7%)	11 (7.4%)	11 (7.4%)
Influencing	2 (1.3%)	1 (.7%)	7 (4.7%)	6 (4.0%)
Routine Interactive	15 (10.1%)	4 (2.7%)	18 (12.1%)	20 (13.4%)
No Codable Function	9 (6.0%)	2 (1.3%)	11 (7.4%)	21 (14.1%)

do not report coordinated functions for questions and responses in either the home or school setting. But some children do define questions and responses as having coordinated functions. And some do perceive a congruency of function across settings. Furthermore, in both settings there are a number of children who do not report codable functions for either questions or responses. What do these differences mean for classroom learning, and where do they stem from? We turn next to examine patterns of relationships between pupil perceptions of question-response functions and other variables.

Family language factors and pupil perceptions of discourse at home and in classrooms. Contrary to what many might expect, we have found no significant ethnic differences in children's perceptions of the social functions of questions and responses at home or in lessons. There are differences in definitions of functions of questions in lessons that approach significance ($p.<10$), with Mexican-American pupils tending to define questions as Instructional somewhat more frequently, and as Informative or Interactive somewhat less frequently than might be expected by chance, while Anglo pupils reverse this pattern. These data are presented in Tables 10, 11, 12, and 13.

It is also the case that there are no significant ethnic differences in pupils' tendencies to view questions and responses as having congruent functions at home and at school. As Table 14 indicates, ethnic differences in perceiving question functions as having congruency in the two settings do approach significance ($p.<10$), with Mexican-Americans tending to report congruency somewhat less frequently than might be expected by chance. Table 15 presents the data on home-school congruency in functions of responses.

It is clear, then, that while there is a tendency for the Mexican-American children in this school to perceive the functions of questions in lessons somewhat differently than Anglo children, this is not a strong enough pattern to achieve statistical significance.

Table 10

Pupil Perceptions of the Functions of Questions in Lessons, Compared by Ethnic Background
(N=155)

	Anglo	Mexican-American	Black or Other Minority
Instructional	18	37	10
Other Functions	23	15	12
No Codable Function Given	14	19	7

$x^2 = 8.29$; df=4; $p < .10$

Table 11

Pupil Perceptions of the Functions of Responses in Lessons, Compared by Ethnic Background
(N=155)

	Anglo	Mexican-American	Black or Other Minority
Interactive	19	21	10
Other Functions	16	22	7
No Codable Function Given	20	28	12

Table 12

Pupil Perceptions of the Functions of Questions in Family Conversations, Compared by Ethnic Background (N=158)

	Anglo	Mexican-American	Black or Other Minority
Informative	30	41	17
Other Functions	8	10	6
No Codable Function Given	20	17	9

Table 13

Pupil Perceptions of the Functions of Responses in Family Conversations, Compared by Ethnic Background (N=158)

	Anglo	Mexican-American	Black or Other Minority
Interactive	25	24	12
Other Functions	14	27	12
No Codable Function Given	19	17	8

Table 14

Pupil Perceptions of Home-School Congruency in the Functions of Questions, Compared by Ethnic Background

	Anglo	Mexican-American	Black or Other Minority
Report Congruency of Functions	10	5	4
Report Incongruency of Functions	31	47	18

$x^2 = 5.18$; df=2; $p < .10$

Table 15

Pupil Perceptions of Home-School Congruency in the Functions of Responses, Compared by Ethnic Background

	Anglo	Mexican-American	Black or Other Minority
Report Congruency of Functions	11	13	1
Report Incongruency of Functions	24	29	16

$x^2 = 4.56$; df=2; $p < .25$

Classroom language factors and pupils' perceptions of question and response functions. The classroom language factors to be considered here are grade level, the teacher's use of questions as identified by an outside observer (our sociolinguistic specialist), and the teacher's perception of the function of questions and responses in the lessons observed. The pupil perceptions of classroom discourse to be considered are the functions of questions and responses in the lessons observed, and congruency between pupil definitions of the functions of questions and responses at home and at school.

Because of the low frequency of some categories of functions of questions and responses, and in keeping with the sociolinguistic thesis that participant perceptions define the social meaning of language, in examining relationships among these variables, pupil definitions of function have been organized into three categories: the "dominant" perception, "other" perceptions, or no codable function given. For questions, the dominant perception is that their function is Instructional, and other perceptions are that their function in Informative or Routine Interactive. For responses, the dominant perception is that their function is Routine Interactive, and other perceptions are that their function is Informative or Instructional.

There are no significant grade level differences in pupil perceptions of the functions of questions in lessons (see Table 16), but there are grade level differences ($p < .05$) in their perceptions of the functions of responses (see Table 17). These differences derive mainly from the tendency for fourth graders to define responses as having an Informative or Instructional function more frequently, and to give no codable function less frequently than would be expected by chance, while these tendencies are reversed for third graders. This suggests that there may be some development over time in children's tendency to think of their responses as having some purpose, or to be able to define a purpose.

TABLE 16

Pupil Perceptions of the Function of Questions in Lessons, Compared by Grade Level

(N=155)

	Second Grade	Third Grade	Fourth Grade
Dominant Function (Instructional)	12	29	24
Other Functions (Informative, Routine Interactive)	6	26	18
No Codable Function Given	8	25	7

$X^2 = 6.11$; df = 4; $p < .25$

TABLE 17

Pupil Perceptions of the Function of Responses in Lessons, Compared by Grade Level

(N=155)

	Second Grade	Third Grade	Fourth Grade
Dominant Function (Routine Interactive)	9	22	19
Other Functions (Informative, Instructional)	8	18	19
No Codable Function Given	10	39	11

$X^2 = 9.8$; df = 4; $p < .05$
contingency coefficient = .25

There are no significant classroom differences in pupil perceptions of the functions of responses in lessons (see Table 19), but there are strong classroom differences in their perceptions of the functions of questions (see Table 18). These differences derive mainly from the tendency of Teacher F's pupils to define questions as having Informative/Interactive functions, while Teacher E's pupils tend to define them as having instructional functions. The tendency of Teacher C's pupils to give no codable function more frequently than would be expected by chance also contributes strongly to this significant Chi square.

These classroom differences in pupil perceptions of the functions of teacher questions are very instructive when they are viewed in the light of teacher's use of questions, as reported by our sociolinguistic specialist. Teachers E and F are both fourth grade teachers. Their language arts lessons were regularly based on the material contained in the same language arts testbook. But their use of questions in the classroom differs markedly.

In a more general sociolinguistic analysis of the discourse in each classroom than the one presented earlier (the analysis to be presented here includes data from all six of the lessons taught) Roger Shuy describes Teacher F's lessons as having many of the elements of ordinary conversation. For example, these are several comments from the analytic protocol:

1) Her introduction consists of a personal anecdote topically appropriate for a discussion with almost anyone;
2) The anecdote is followed by a leading question which offers the class an opportunity to bid for a turn to join the conversation;
3) There are exchanges in which students seemingly direct the discourse with the introduction of a new topic or subtopic, and in these cases the teacher responds with a question which both builds on what the student has contributed, while at the same time allow-

TABLE 18

Pupil Perceptions of the Function of Questions in Lessons, Compared by Classroom

(N=155)

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Dominant Function (Instructional)	13	9	8	13	18	5
Other Functions (Informative, Routine Interactive)	6	6	9	10	2	17
No Codable Function Given	8	8	1	6	3	4

$X^2 = 30.68$; df = 10; $p < .001$

contingency coefficient = .41

TABLE 19

Pupil Perceptions of the Function of Responses in Lessons, Compared by Classroom

(N=155)

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Dominant Function (Routine Interactive)	9	6	9	7	8	11
Other Functions (Informative, Instructional)	7	4	4	11	9	10
No Codable Function Given	10	13	14	11	6	5

$X^2 = 13.31$; df = 10; $p < .25$

ing the teacher to design precisely where the topic will go, a strategy which evidences teacher interest in what the student has said;

4) She speaks in a friendly informal style, adding her own experience to those of her students in language that makes her "just one of the gang" conversationally speaking; and

5) Her lesson closings are much less elaborate and lengthy than her lesson openings, as she generally summarizes what has been done, evaluates the class' performance, and that's it, a pattern which appears to be a confirmation of the natural conversational style of her lessons.

In this teacher's classroom students deviate strongly from the typical pattern of defining the functions of classroom questions as instructional. One third of the pupils report that questions have an informative function, as is typical of their perceptions of family conversations, while one third report that they have an interactive function. The teacher, herself, also perceives her questions as serving an informative function.

The sociolinguist's description of Teacher E's classroom discourse is very different, as evidenced by the following protocol excerpt:

> One thing that characterizes the language in this classroom is that children get many chances to use it. Long turn-taking exchanges take place. The individual pupil does not speak for long periods of time, but many students get a chance to offer short answers or comments. Always, the teacher exerts control. She inches forward slowly, never fully revealing the right answers and often only giving hints of them. It is clear that turn taking is classical in her classroom, but it is also clear that the turns do not build vertically, toward larger knowledge. Instead, they build horizontally, toward further elaboration or expansion. Many, many children get a chance to describe what they think a character in a story might look like, or which odd word they remember in a poem.

In this teacher's classroom, children almost never deviate from the dominant perception of questions as serving an instructional function.

Only 2 children out of 23 suggest that this teachers' questions are asked because the teacher "wants to know" something. The teacher agrees with pupils in that she does not view her questions as informational either, but identifies them as instructional in one lesson, and reports that they are designed to serve an interactive function in the other lesson.

Teacher C's use of questions in lessons was different from all of the other teachers in this study, in that she relied almost exclusively upon the questions that were presented in the teacher's guide of the textbook. In lesson after lesson she read these questions from the book, and called on pupils to respond. In this classroom many children were unable to give us a purpose for the questions that were asked. One pupil, when asked whether he ever said these kinds of things (questions) in lessons replied "no," and explained that this was because he didn't have "the list" of questions to be asked. This teacher reported that her questions served an informational function in one lesson, and an instructional function in the other, but she had some difficulty in explaining the reason for children's responses to questions in one of these two lessons, saying initially that she wasn't sure what purpose pupils had for their comments, but eventually suggesting that they probably made these comments because she had asked a question.

These findings suggest that classroom differences in pupil perceptions of the functions of teacher questions are reality-based and in fact reflect actual differences in the ways in which teachers use questions. This interpretation is supported by a brief examination of classroom differences in pupil perceptions of congruency between the functions of questions in lessons and in family conversations. Table 20 presents these data. No test of significance has been made because of the extremely low frequency of pupils who report this type of congruency. However, it is

Table 20

Pupil Perceptions of Home-School Congruency in the Functions of Question, Compared by Classroom

(Number of Pupils Reporting Congruency or Lack of Congruency)

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Report Congruency of Functions	2	3	1	4	1	8
Report Lack of Congruency of Functions*	27	20	26	25	22	18

* These figures include those children who report no codable function in one or both settings.

impressive to note that of the 19 pupils who do perceive questions as serving congruent functions in the two settings, 8 (42 percent) are pupils in Teacher F's classroom, where the teacher, pupils, and sociolinguistic observer all report that questions do tend to serve an informative function, or operate much as they do in natural conversation.

Participation in class discussion and perceptions of question and response functions. While there are clear pupil differences in perceptions of the functions of questions and responses in lessons, these do not appear at first glance to relate to pupil differences in frequency of participation in class discussions. Tables 21 and 22 present these data. The Chi square test shows no significant relationship in either case, so we must conclude that children who have a "clearer" understanding (or share the common interpretation) of the ways in which questions and responses function in lessons do not necessarily participate more actively in the flow of interaction that revolves around the solicit-response-react cycle identified by Bellack and others (1966).

However, when an analysis of variance was performed, using the SAS regression analysis program, with frequency of participation in class discussion as the dependent variable, and pupil categorizations of the functions of questions, responses, and teacher praise as independent ("dummy") variables, some potentially useful additional information was provided. The regression is significant [$F=2.01$ (9,114), $p<.044$, $R^2=.137$]. The interesting fact is that the single variable of defining teacher questions as having an informative function contributes significantly to the explained variance ($p<.01$). Thus it appears that pupils who perceive teacher questions as serving more conversational functions, although they are few in number, may tend to participate more actively in class discussions than those who perceive questions as serving an instructional function, although this perception may be more reflective of reality.

Table 21

Pupil Perceptions of the Functions of Questions in Lessons, Compared to Frequency of Participation in Class Discussions
(N=155)

Frequency of Participation in Class Discussions	Functions of Questions Identified		
	Dominant Function (Instructional)	Other Functions (Informative, Routine Interactive)	No Codable Function
High	18	22	10
Middle	23	15	14
Low	25	13	15

Table 22

Pupil Perceptions of the Functions of Responses in Lessons, Compared to Frequency of Participation in Class Discussions
(N=155)

Frequency of Participation in Class Discussions	Functions of Responses Identified		
	Dominant Function (Routine Interactive)	Other Functions (Informative, Instructional)	No Codable Function
High	19	16	15
Middle	17	12	23
Low	19	17	22

Pupil perceptions of questions and responses and success in school. We turn next to compare pupil perceptions of the functions of questions and responses in lessons to the variables of success in school. There are no significant differences in patterns of pupil definitions of either questions or responses in lessons based on any of the three concurrent status variables considered separately (entering reading achievement, status with peers, or status with teacher). There are significant differences in definitions of the functions of questions in relation to composite concurrent status* (see Table 23). These differences stem from the fact that pupils with lower composite status define questions as instructional less frequently, and give no codable function more frequently than might be expected by chance. Thus it would appear that children who have not yet fully identified a purpose for questions in lessons are children who also tend to be less successful in the classroom status system.

Table 24 presents the data on composite concurrent status and pupil perceptions of the functions of responses in lessons. There are no significant differences in perceptions of responses, based on composite status.

A regression analysis was performed to examine the relationship of pupil perceptions of the functions of questions and responses to final reading achievement. The dependent variable was Fall '79 reading achievement, and Fall '78 reading achievement, definitions of functions of questions in lessons, and definitions of functions of answers in lessons were entered into the equation. The overall regression is significant [$F=23.55$ (7,114), $p<.0001$, $R^2= .59$], and as would be expected, a signficant amount of the variance is

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* In figuring composite concurrent status, pupils who had low status on two or more of the three concurrent status variables were categorized as "low," pupils who had high status on two or more variables were categorized as "high," and other pupils were categorized as "middle."

Table 23

Pupil Perceptions of the Function of Questions In Lessons, Compared to Composite Concurrent Status

(N=127)

	Low Status	Middle Status	High Status
Instructional	9	31	17
Informative or Interactive	9	22	11
No Codable Function	14	9	5

x^2=12.16;df=4; $p < .025$
contingency coefficient = .30

Table 24

Pupil Perceptions of the Functions of Responses in Lessons, Compared to Composite Concurrent Status

(N=127)

	Low Status	Middle Status	High Status
Interactive	10	18	13
Informative, Instructional	8	20	10
No Codable Function	14	24	10

accounted for by Fall '78 reading achievement ($p < .0001$). Neither the definitions of functions of questions nor the definitions of functions of answers contribute significantly to the explained variance.

It would appear, therefore, that while understanding the function of questions and responses relates to composite concurrent status, it does not relate to future success in school, when that is defined only in terms of final reading achievement. But let us return to our earlier evidence of classroom differences in perceptions of the function of questions in lessons, and consider whether these differences relate to final reading achievement.

A regression analysis was performed with Fall '79 reading achievement as the dependent variable, and Fall '78 reading achievement, information load*, frequency of participation in class discussion, and teacher all simultaneously entered into the equation as independent variables. The overall regression was significant $[F=28.57\ (8,98),\ p < .0001,\ R^2 = .60]$, and both entering reading achievement and frequency of participation in class discussion contributed significantly to the explained variance ($p < .0001$ for each). Teacher differences also contributed significantly to the explained variance. When these teacher differences are examined more closely we find that there are no significant differences among the three third grade teachers in pupils' final reading achievement, when entering reading achievement is controlled. There are, however, significant differences between the two fourth grade teachers, with Teacher F's pupils tending to achieve more in reading than Teacher E's.

These are the two classrooms which exhibit the strongest differences in pupil perceptions of the functions of teacher questions, with pupils of

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* A measure of the amount of information that pupils reported they heard in videotaped lessons.

Teacher F defining questions as serving informative and interactive functions, while Teacher E's pupils perceive them as serving instructional functions. Our sociolinguistic specialist also identified differences in these two teachers' use of questions, with Teacher F exhibiting a style approaching that of natural conversation, while Teacher E used questions in a "horizontal" fashion, gathering many responses to the same question, and remaining at the same level of question and response throughout. It is also the case that Teacher F's pupils are much more apt to view questions at home and in school as having congruent functions than are pupils from any other classroom.

Taken together, these findings suggest that Teacher F's pattern of a somewhat conversational style in use of questions, a style which makes question-asking in lessons more similar to question-asking in family conversations, may contribute to improved reading achievement on the part of her pupils. It is also worth reiterating here that perceiving teacher questions as serving an informative function contributed significantly to the variance in frequency of participation in class discussions, while frequency of participation in class discussions in turn contributed significantly to the variance in final reading achievement. Thus, the relationships between pupil perceptions of the functions of questions in lessons and pupil success in school do not appear to be simple or direct, but relationships do seem to be there. Certainly this is an area of investigation worth pursuing further.

Summary of relationships among variables. To summarize, in this exploratory descriptive analysis of participant perceptions of the functions of questions and responses in lessons and in family conversations, we have found that for our particular population:

1) Pupils do identify the apparently real differences in the functions of questions in lessons and in family conversations, while they tend to see responses as serving more similar functions in the two settings;

2) There are no significant ethnic differences in pupil perceptions of the functions of questions or responses at home or at school;

3) There are strong classroom differences in pupil perceptions of the functions of questions in lessons, and these differences correspond to differences in teachers' use of questions, as identified by a sociolinguistic specialist;

4) These classroom differences in pupil perceptions of the functions of questions in lessons appear to have some relationship to classroom differences in final reading achievement, when entering reading achievement is controlled for;

5) There are significant relationships between pupil perceptions of the functions of questions in lessons and composite concurrent classroom status; and

6) There are no direct significant relationships between perceptions of questions or responses and final reading achievement, but the evidence suggests that defining teacher questions as informative does contribute to higher frequency of participation in class discussions, and this variable is significantly related to final reading achievement.

Salience of Questions and Responses

General data collection procedures, described and reviewed earlier in this paper, permitted the comparison of children's reporting of any category of speech act or class of utterance with lesson transcripts (derived from videotape replays) containing the actual utterances of pupils and teachers during the lessons. Here we compare patterns in pupil reporting of teacher questions and pupil answers to the actual patterns occurring on the videotapes. An important assumption to be noted here is that patterns of pupil recall during videotape replay reflect to some extent patterns of pupil attention to classroom discourse during the lessons themselves, or at least reflect what stands out to pupils enough to be recalled and reported.

The major questions of interest here are:

1) Do pupils attend more to teacher questions or to pupil answers?

2) Is attention to questions and answers related to the pupil variables of grade level, ethnic background, reading achievement, and peer status?

3) Do pupils attend differentially to different types of teacher questions?

4) Do pupils attend differentially to classmates' answers depending on the type of question being answered?

For purposes of this study "questions" were defined to include all utterances inflected as questions by the teacher, regardless of the function of the utterance. In this manner, for example, commands and requests (e.g., "Would you look at these words on the board?"), teacher commentary (e.g., "That was really a fine program, wasn't it?"), and a variety of other items not functioning to elicit answers but voiced in question form were included for analysis. However, the incidence of the use of "O.K.?" was not tallied, and any use of a child's name by itself and inflected as a question (e.g., "Cynthia?") to "call on" a child was not included for analysis. All utterances not inflected as questions, which nonetheless functioned to elicit answers, were also included as questions in this analysis (e.g. "Take the first sentence and tell how it is different from the next one.").*

One lesson was omitted from all analyses because it contained almost no teacher questions and consisted in the main of pupils reading brief stories they had written prior to the videotaping. The remaining 35 lessons contained

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* Editor's Note: Tenenberg, who did this analysis, uses a slightly different category system than Shuy, who did the earlier analysis, but they both distinguish question form from question function. Note also that Tenenberg's 1250 questions come from 35 lessons, while Shuy's 597 come from 12 lessons.

1250 teacher questions and 1210 pupil answers, and included a variety of types of both content and management questions.

Topics of interest are reported below under a series of headings. As each investigation is reported, the specific analysis procedures and statistical tests will be outlined, followed by the results for that investigation.

Attention to questions vs. answers. The question addressed here was, to which did pupils attend more: teacher questions or pupil answers.

1) Procedure. For each lesson the ratio of pupil mentions of teacher questions to the actual number of teacher questions audible on the videotape was computed. The ratio of pupil mentions of answers to teacher questions to the actual number of audible answers on the videotape was also computed. The magnitude of these two ratios was compared for each lesson. A Mann-Whitney U test (Siegel, 1956) was used to test the statistical significance of the results.

2) Results. In 33 of the 35 lessons the ratio for attention to pupil answers was larger than the ratio for attention to teacher questions. The Mann-Whitney U statistic is significant at $p<.001$. Clearly, attention to answers was greater - even after adjusting for numbers of questions and numbers of answers, which the ratios of attention do.

Identical procedures were followed with teacher reporting of questions and answers after videotape replay. In 32 of the 35 lessons the ratio for teacher attention to pupil answers was larger than the ratio for teacher attention to teacher questions. The Mann-Whitney statistic associated with these results is significant at $p<.001$. Thus, both teachers and pupils report hearing more pupil answers than teacher questions, even though teacher questions actually occur somewhat more frequently.

Pupil characteristics and overall attention patterns. The question addressed here was, are attention to questions and answers related to the pupil variables of grade level, ethnic background, reading achievement, and peer status.

1) *Procedure*. For each pupil the total mentions of teacher questions made after videotape replay were summed over the three replay sessions in which the child participated. This value was divided by the actual total number of teacher questions asked during the replayed episodes to produce a "ratio of attention" (r.a.). For example, a pupil mentioning 12 of 50 questions actually asked by the teacher over the three lessons would have an r.a. of 20 ÷ 50 or .240. All r.a.'s were ranked from lowest to highest. A Kruskall-Wallis analysis of variance (Siegel, 1956) was performed to test the statistical significance of differences in average ranks for levels or categories within each of the pupil variables of interest.

2) *Results*. Summaries of the Kruskall-Wallis analysis appear in Tables 25 through 28. With respect to grade level, Table 25 shows that differences in average rank are significant for attention to both questions and answers. Attention to answers varies directly and systematically with grade level, with 2nd grade lowest, 3rd grade next, and 4th grade highest. Furthermore, 4th graders as a group attended less than children at lower grade levels to teacher questions.

Table 26 shows that differences in average rank for ethnic groups are not significant for either attention to questions or to answers. A curious pattern is the lower attention paid to children's answers by "Other Minority" students, mainly Asian-American and Portuguese-American children.

Regarding reading achievement, pupils scoring above the second quartile (Table 27) attended more to teacher questions than children scoring below the

Table 25

Summary of Kruskall-Wallis Analysis:
Attention to Questions and Answers by Grade Level
(N=123)

	Average Rank for Grade Levels 2nd (n=17)	 3rd (n=69)	 4th (n=37)	Value of H	Prob. H Exceeds
Attention to Questions	62.47	65.87	55.77	6.29	.05
Attention to Answers	56.03	61.21	68.08	8.03	.02

Table 26

Summary of Kruskall-Wallis Analysis:
Attention to Questions and Answers by Ethnic Categories
(N=123)

	Average Rank for Ethnic Categories Anglo (n=49)	 Black (n-15)	 Mexican-American (n=50)	 Other Minority (n=9)	Value of H	Prob. H Exceeds
Attention to Questions	58.66	63.37	64.86	66.94	5.19	.20
Attention to Answers	60.82	66.40	65.01	49.83	6.28	.10

second quartile (significant beyond .001), but the trend reverses regarding attention to pupil answers. (By extrapolation from the appropriate table in Siegel (1956) the H value for the latter analysis is associated with statistical significance at approximately $p=.062$).

Table 28 shows attention to pupil answers to be related directly and significantly to peer status with a particularly high average rank for the High status group. A similar trend from Low to High status appears for attention to teacher questions with a particularly low average rank for the Low status group, but the analysis is not statistically significant at $p<.05$.

Clearly, for pupils in this study, grade level, reading achievement, and peer status are significantly related to attention variation -- each in its own way -- but ethnicity is not significantly related.

Differential attention to questions. The question of interest here was, did pupils attend differentially to different types of teacher questions.

1) Procedure. An initial set of 18 mutually exclusive categories was designed and used to code all teacher questions as defined earlier. The set "captured" 1250 or 98 percent of the questions asked in 35 of the 36 lessons. One lesson, consisting almost exclusively of children reading brief stories they had written at an earlier time, was omitted from the data analysis because it contained almost no teacher questions. The 31 questions not captured by the coding set included seven questions referring to events extraneous to the lessons themselves (e.g. asking a child to close the window), ten questions whose meanings were not clear enough to allow for coding, and 14 dissimilar questions which simply did not fit into any of the 18 categories.

The coding system for teacher questions was also used to code pupil answers. Each answer was coded according to the type of teacher question eliciting an answer. In many cases the question immediately preceded the answer under study. In other cases, however, particularly when an asked question was responded to

Table 27

Summary of Kruskall-Wallis Analysis:
Attention to Questions and Answers by Reading Achievement
(N=123)

	Average Rank for Achievement Quartiles				Value of H	Prob. H Exceeds
	Q1 (n=42)	Q2 (n=40)	Q3 (n=26)	Q4 (n=15)		
Attention to Questions	48.32	60.79	80.36	73.23	24.36	.001
Attention to Answers	65.61	66.38	54.04	57.30	7.44	.10

Table 28

Summary of Kruskall-Wallis Analysis:
Attention to Questions and Answers by Peer Status Levels
(N=123)

	Average Rank for Peer Status Levels			Value of H	Prob. H Exceeds
	Low (n=25)	Middle (n=72)	High (n=26)		
Attention to Questions	50.06	63.38	67.02	3.26	.20
Attention to Answers	57.84	60.58	71.83	7.21	.05

by several children one after the other, sometimes with interspersed teacher comments, it was necessary to search backward in the dialogue to find the question being answered.

For purposes of statistical analysis the categories in the initial coding set were combined to produce six question groupings or general categories. Two contain questions whose primary functions are not to elicit answers from pupils relative to the content of the lessons. The other four contain questions whose primary function is to elicit pupil answers relative to lesson content.

The categories are:

1. Lesson Flow- All questions which refer to the "logistics" of a lesson, such as commands or requests for non-verbal behavior (e.g., "Would you look at the first example?"), questions serving to focus attention in a general manner (e.g., "Remember yesterday when I said we would play a game today?"), questions referring to lesson timing (e.g., "Have you had enough time to read that?"), requests to repeat an answer when it appears the teacher was unable to hear the answer, and the like;

2. Rhetorical- Questions the teacher uses to "make a point" in which the answer is obvious from the content of the question itself (e.g., "so even though your sentences are about the same thing, they are all different, aren't they?") or from the context in which asked (e.g., "That animal barked very loudly. So we know he is a what?");

3. Lower Divergent- Questions whose function is to elicit pupil "content" answers requiring simple recall or description where there are a variety of possible appropriate answers (e.g., "What did you see on the way to school today?" or "What happened in the story?");

4. Lower Convergent- Questions whose function is to elicit pupil "content" answers requiring simple recall or description where there is only one (or at most two) possible appropriate predetermined answers (e.g., "How many dogs were in the story?" or "Did you see any mail carriers on the way to school?").

5. Higher Divergent- Questions eliciting answers requiring more complex or abstract thinking than recall and description where there are a variety of possible appropriate answers, such as questions asking for mental processes that include searching for similarities and/or differences, putting items into groups based on common qualities, making inferences, predicting consequences, or making generalizations; and

6. Higher Convergent- Questions eliciting answers requiring more complex or abstract thinking than recall and description where there is only one

possible appropriate predetermined answer (e.g., "Rearrange the words in this scrambled sentence so they make sense." or "How are these words all alike?" ...where the words have been selected to contain only one common characteristic).

"Lower" and "higher" are used in this paper as terms readers familiar with the literature on cognitive levels of questions will recognize. Readers are cautioned, however, to keep in mind that "higher" order questions used with second, third, and fourth grade pupils do not customarily approach the degree of complexity and abstractness of questions which could appropriately be addressed to older learners. Patterns found in this study might not extend to "higher" order questions of greater magnitude than those used by the teachers during this study.

For each of the above categories in each lesson a measure of "mention opportunity" (m.o.) was computed by multiplying the number of teacher questions tallied for the category by the number of pupils viewing replay of that lesson. For example, if 7 questions were asked in the Rhetorical category during a particular videotaped lesson and 12 children were asked to watch the lesson and report what they heard being said, the m.o. was 7 times 12, or 84.

The total number of mentions of any of the questions in a category for each lesson was divided by the m.o. for that category to give a "ratio of mention" (r.m.). In the example above if 10 Rhetorical questions were mentioned in total by the 12 children involved, the r.m. would be 10/84 or .119.

For each lesson r.m.s for each of the six categories were ranked from smallest to largest (smallest = 1). Friedman's analysis of variance for ranks as described in Siegel (1956) was carried out separately for each teacher's six lessons (five for one), and across all 35 lessons in the study.

2) Results. Results of the analysis of variance by ranks separately across each teacher's lessons and across all 35 lessons are given in Table 29. (The table is interpreted by reading across the rows, not down the columns).

Inspection of Table 29 shows that although there are differences among average ranks for the six categories, many differences are quite small and the variation for only Teacher D is signficant. For all other teachers the pattern show on Table 29 is not statistically significant, meaning further that patterns of attentiveness to questions shifted among the lessons of each teacher. For Teacher D it is interesting to note the relatively high ranking of attention to *lower* order questions. *Lower convergent* ranks highest (5.33), and *Lower Divergent* ranks next highest (4.75), a pattern not evident for any other teacher.

Differential attention to answers. The question of interest here was, did pupils attend differentially to classmates' answers depending on the type of question being answered (using all six categories of analysis).

1) *Procedure*. The procedures followed here were identical for those pertaining to "questions", reported immediately above, except that numbers of pupil answers and mentions of answers were used in computing the measure of mention opportunity (m.o.) and ratio of mention (r.m.). For example, if 36 answers were given to *Lower Divergent* questions during a particular lesson and 12 pupils watched the replay of that lesson, the m.o. would be 12 times 36 or 432. If the 12 children together made 60 mentions of *Lower Divergent* questions, the r.m. is 60/432 or .139.

2) *Results*. Results of the analysis of variance by ranks separately across each teacher's lessons and across all 35 lessons are give in Table 30.

This table shows that across all 35 lessons, pupil mention of classmate answers is significantly related to the type of question asked. However, this pattern holds true across the lessons of only one teacher if $p=.05$ is set as the limit to statistical significance. For all other teachers, there was not sufficient stability in variation in attention to answers by question type among the person's six lessons to produce a statistically significant pattern.

Table 29

Summary of Analysis of Variance by Ranks for Pupil Mention of Questions: Question Categories Across Lessons*

	Average Ranks						
	Lesson Flow	Rhetorical	Lower Divergent	Lower Convergent	Higher Divergent	Higher Convergent	Prob. X' Exceed
Teacher A	4.30	4.00	2.50	4.10	2.20	3.90	.40
Teacher B	3.67	3.75	2.83	3.33	4.75	2.67	.40
Teacher C	3.83	2.50	3.92	3.75	3.83	3.17	.80
Teacher D	3.33	2.17	4.75	5.33	3.17	2.25	.02
Teacher E	3.58	2.75	4.33	3.92	3.42	3.00	.80
Teacher F	3.58	3.08	3.75	3.00	4.00	3.58	.90
All 35 Lessons	3.70	3.01	3.71	3.90	3.60	3.07	$p<.20$

* Across 5 lessons for Teacher A, 6 lessons each for Teacher A-F.

Table 30

Summary of Analysis of Variance by Ranks for Pupil Mention of Answers: Categories Across Lessons*

	Average Ranks						
	Lesson Flow	Rhetorical	Lower Divergent	Lower Convergent	Higher Divergent	Higher Convergent	Prob. X Exceed
Teacher A	3.80	2.60	4.30	3.70	3.40	3.20	.80
Teacher B	2.00	2.58	3.42	4.17	5.33	3.50	.05
Teacher C	2.25	2.33	4.33	3.75	5.08	3.25	.10
Teacher D	3.33	2.33	4.33	4.50	3.42	3.00	.40
Teacher E	2.33	3.50	2.67	4.58	4.83	3.08	.20
Teacher F	3.50	1.75	3.08	3.67	4.75	4.25	.10
All 35 Lessons	2.84	2.51	3.67	4.07	4.01	3.39	$p<.001$

* Across 5 lessons for Teacher A, 6 lessons each for Teacher A-F.

Overall, attention to answers to Rhetorical questions has the lowest rank (2.51) and is either lowest or next to lowest in ranking for each teacher separately, except for Teacher E. Next in overall ranking is attentiveness to Lesson Flow answers (2.84). This pattern of low ranking for answers to Rhetorical and Lesson Flow questions is of particular interest. These are categories whose primary function is not to elicit answers. It appears in general that pupil attention (or lack of attention) to answers for these categories is consistent with the function of questions in these categories.

For these data, the highest ranking categories are Lower Convergent (4.07) and Higher Divergent (4.01). There are no consistent patterns showing differential attentiveness to answers selected by higher versus lower order questions, or to answers elicited by divergent versus convergent questions.

It is noteworthy that Teacher B, the only teacher with sufficient stability of attention pattern over her six lessons to result in overall significance, followed a series of instructional "models" in conducting her lessons. She had learned about these models during a Teacher Corps project which was operating at the school prior to the collection of data for the present study. Each model focuses on a different aspect of inductive thinking and follows a prescribed sequence of instructional phases. The models appear in Joyce and Weil, Models of Teaching (1972), as well as other publications by these authors and their collaborators. We cannot help but speculate that Teacher B's significant pattern with its unusually high ranking (5.33) for attentiveness to answers to Higher Divergent questions is related to her use of lessons following these models.

Another interesting pattern, approaching significance, is that of Teacher F. Here we see a relatively high ranking for answers to Lesson Flow questions (3.50) and a higher combined ranking for higher order categories (4.75 and 4.25) than any other teacher. A sociolinguistic expert connected with the research project has analyzed all 36 taped lessons. He has indicated in his reports that Teacher F shows a classroom conversational style more typical of discourse outside of school than the styles of the other teachers in the study. We cannot help but speculate that the atypical patterns of pupil attentiveness to answers during her lessons may be related to Teacher F's use of "ordinary" conversational patterns in her lessons.

Differential attention and reading level. We have found overall attention to teacher questions to be related at a highly significant level to pupil achievement in reading, as noted earlier in this report (see Table 19). In other words, children in this study who are high achievers in reading tend to pay more attention to teacher questions than children who are low achievers in reading. The investigation now turns to a related topic: the question of whether children at various reading achievement levels are attending similarly to the various types or categories of teacher questions and pupil answers investigated.

1) Procedure. To investigate whether children at different reading achievement levels attend similarly to questions and answers by question type, ratios of attention to questions for each question type were computed for pupils below the first quartile in reading achievement and pupils above the third quartile. This was accomplished by summing all mentions of a question type across three lessons for all children at each level separately, and dividing the sum by all questions asked by the teacher during those lessons. The ratios of attention for each achievement level were rank ordered, with "1" assigned to the question type with the lowest ratio and "6" to the question type with the highest ratio. Spearman's rank correlation coefficient was used to test the resultant arrays of ranks for the two groups of pupils, as illustrated in the

figure below. Indentical steps were carried out for attention to answers.

Question Categories

	Lesson Flow	Rhetorical	Lower/ Div.	Lower/ Conv.	Higher/ Div.	Higher/ Conv.
Below Q_1	← Ranked from 1-6 →					
Above Q_4	← Ranked from 1-6 →					

2) Results. Rank correlations are shown in Table 31. Several patterns can be observed. Correlations for attention to answers tend generally to be higher than for attention to questions, indicating greater similarity of attention for high and low achievers in relation to answers. Variation, especially for questions, is considerable, ranging from a positive .943 to a negative .882. Only Teacher F shows what can be considered to be a consistent pattern, in this case one of disagreement in attention to different types of questions by high and low achievers. (Note the special reference to Teacher F in the preceding section). Clearly differential patterns of attention to teacher questions are related at times to reading achievement - but not consistently, to be sure. The suggestion here is that other variables, possibly related to particular lessons, interact with those under study to produce similar attention patterns at some times and to produce dissimilar patterns at other times.

Which categories of questions and answers tend to show most agreement and disagreement between better and poorer readers? Some notion of relative agreement/disagreement can be obtained by examining the differences in ranking of attention for high and low achievers for each category of question and answer,

Table 31

Summary of Rank Correlations: Attention to Question and Answer Categories, Below Q_1 Compared to Above Q_3 in Reading Achievement

		Attention to Questions	Attention to Answers
Teacher A	Group 1	.439	1.00
	Group 2	-.882	.941
Teacher B	Group 1	.600	.928
	Group 2	.290	.200
Teacher C	Group 1	.456	.456
	Group 2	-.086	.464
Teacher D	Group 1	-.068	.059
	Group 2	.943	.829
Teacher E	Group 1	.841	.000
	Group 2	*	*
Teacher F	Group 1	-.551	.371
	Group 2	-.257	.486

* No pupils in this group were above the third quartile in reading achievement.

and computing an average difference in rank for each over the 11 separate analyses reported in Table 31. The average differences in rank are presented in Table 32. In this table, the lower a mean value is, the greater is the agreement between readers below the first quartile and readers above the third quartile.

The highest areas of agreement regarding teacher questions in Table 32 are for Lesson Flow and Rhetorical, the two categories where questions do not function primarily to elicit pupil answers. The area of greatest dissimilarity is in attention to Higher Divergent questions.

Regarding attention to answers, similarity of attention is greatest for Lower Convergent, and lowest for Rhetorical. This latter result is particularly interesting because it suggests that pupils at varied reading achievement levels may view differently questions asked primarily to give information, summarize and make or emphasize the teacher's ideas.

Summary. To sum up, for pupils in this study:

1) There was significantly more attention to pupil answers than teacher questions(and this was true for teachers as well as pupils);

2) Attention to teacher questions was significantly greater for higher achievers in reading compared to lower achievers;

3) Higher and lower achievers often exhibited different patterns of attention regarding various types of teacher questions, and the greatest similarity appeared for questions that do not function primarily to elicit pupil answers;

4) Attention to pupil answers varied directly and significantly with grade level, and directly and significantly with peer status, with higher grades and higher peer status pupils reporting pupil answers more frequently;

5) Attentiveness to questions and answers did not appear to be related to ethnic background of pupils;

6) Attention to different type of questions varied considerably among lessons and among teachers; and

7) Attention to answers was significantly related overall to question type, but varied considerably among the lessons of all but one of the teachers.

Table 32

Mean Rank Differences Between Attention of High and Low Readers to Categories of Teacher Question and Pupil Answer

	Question/Answer Categories					
	Lesson Flow	Rhetorical	Lower Divergent	Lower Convergent	Higher Divergent	Higher Convergent
Attention to Teacher Questions	1.23	1.09	1.95	1.91	2.18	1.59
Attention to Pupil Answers	1.00	1.41	1.18	.91	1.00	1.23

Pupil and Teacher Perceptions of the Functions of Praise in Lessons

We turn next to examine participant perceptions of teacher praise, a classroom discourse variable that has been of interest in a number of prior studies and reviews of studies of teaching (Flanders, 1970; Rosenshine, 1971; Dunkin & Biddle, 1974; Stallings & Kaskowitz, 1974; Brophy & Evertson, 1974; Soar & Soar, 1979).

General patterns of perceptions of the functions of teacher praise. The general patterns of pupil responses to the task of identifying the reasons teachers had for praise statements made in lessons are presented in Table 33. While a variety of reasons are given, the response that teachers give praise because pupils have good ideas is clearly the predominant perception.

For purposes of further analysis these initial categories of response have been combined to form four major categories of the functions of teacher praise. These are: Deserved (pupils had the right/good idea); Instructional (teacher wants pupils to learn; teacher wants pupils to feel good; teacher wants pupils to know it was the right/good idea); Routine Interactive (pupils participated; teacher wants to get pupils' attention); No Codable Function Given (other unique responses; no reason given; praise attributed to pupils).

Table 34 compares pupil perceptions of the functions of praise to teacher perceptions, using these four major categories. There are clear differences, with the predominant teacher perception being that praise serves an instructional function, while the predominant pupil perception is that praise occurs because pupils deserve it. These differences in perception may not be as incongruent as they appear at first glance, since the five teachers who report an instructional function all said that priase was used for purposes of feedback, i.e., to let pupils know they had the right/good idea. We might interpret this

Table 33

Pupil Perceptions of the Functions of Teacher Praise
General Patterns
(N=139)

Reported Function	Number of Pupils	Per Cent Pupils
Because pupils had the right/good idea	82	59.0
Teacher wants pupils to learn	10	7.2
Teacher wants pupils to feel good	11	7.9
Teacher wants pupils to know it was right/good idea	11	7.9
Because pupils participated	2	1.4
Teacher wanted to get pupils' attention	2	1.4
Other, unique responses	7	5.0
No reason given	7	5.0
Praise attributed to pupils	7	5.0

Table 34

Pupil Perceptions of the Functions of Teacher Praise
Compared to Teacher Perceptions

	Number Pupils	Number Teachers
Reported Function	(N=139)	(N=6)
Deserved	82	1
Instructional	32	5
Routine Interactive	4	0
No Codable Function Given	21	0

pattern as a demonstration that this purpose was served quite effectively, since most pupils report that the praise occurred because their ideas were right/good.

Family language factors, and pupil perceptions of praise, pupil participation in class discussions, and pupil success in school. One important finding in this study is the consistent occurrence of no significant ethnic differences. From one point of view these findings are quite surprising, but we believe that they do reflect the real state of affairs for this group of subjects. We noted in our introduction that the school under investigation here is particularly stable in student population for a lower socioeconomic community, that friendship patterns demonstrate an integration of cultural groups, and that parents are actively supportive of the school program. In this section we examine further the evidence with regard to lack of ethnic differences.

There are no significant ethnic differences in either pupil perceptions of the functions of teacher praise, or in frequency of participation in class discussions (see Tables 35 and 36). Furthermore, there is only one instance where low classroom status is significantly associated with minority group membership. Ethnicity and "concurrent status" are examined in Tables 29, 30, and 31, where ethnic background in compared to entering reading achievement, to peer status, and to status with teachers. As might be expected from previous studies, which have suggested that educational failure often appears to result from sociolinguistic differences between teachers and pupils (Stubbs, 1976), Table 37 shows a significant relationship ($p < .05$) between ethnicity and entering reading achievement, with Mexican-American children tending to be in the lower quartiles in reading. However, there is no significant relationship between ethnicity and peer status or status with teacher (Tables 38 and 39). Mexican-American children are no less apt to be successful in the classroom

Table 35

Ethnic Patterns in Pupil Perceptions of Functions of Teacher Praise

(N=139)

	Anglo	Mexican-American	Black or Other Minority
Deserved	30	35	17
Instructional or Interactive	12	19	5
No Codable Function Given	8	6	7

Table 36

Ethnic Patterns in Pupil Participation in Class Discussions

(N=163)

	Anglo	Mexican-American	Black or Other Minority
High Participation	25	19	10
Middle Participation	17	27	10
Low Participation	15	27	13

Table 37

Distribution of Subjects According to Ethnic Background and Entering Reading Achievement

	Anglo	Mexican-American	Black or Other Minority
Above Second Quartile in Reading	22	15	12
Below Second Quartile in Reading	18	21	10
Below First Quartile in Reading	14	34	8

$x^2=9.75$; df=4; $p<.05$
contingency coefficient = .24

Table 38

Distribution of Subjects According to Ethnic Background and Status with Peers

	Anglo	Mexican-American	Black or Other Minority
High Peer Status	18	16	7
Middle Peer Status	14	18	14
Low Peer Status	18	23	5

$x^2=6.63$; df=4; $p<.25$

Table 39

Distribution of Subjects According to Ethnic Background and Status with Teacher

	Anglo	Mexican-American	Black or Other Minority
High Status	24	17	11
Middle Status	14	27	10
Low Status	17	27	10

$x^2=5.71$; df=4; $p<.25$

social system than are Anglos or Blacks and other minority groups.

A regression analysis using status with teacher as the dependent variable, and relative rank in class on entering reading achievement, peer status, and ethnic background as independent variables, helps to corroborate these findings of minimal status deficit associated with ethnicity. The over-all regression is signficiant $\left[F = 5.98\ (5,118),\ p < .0001,\ R^2 = .20\right]$ and both entering reading achievement and peer status contribute significantly (with exact p values of .0008 and .0240 respectively) to the explained variance, but ethnic background variables do not.

The same pattern of minimal relationship between ethnic background and success in school is apparent when "future status," or final reading achievement, is examined. A second regression analysis demonstrates this. Here Fall '79 reading achievement is the dependent variable, and Fall '78 reading achievement, peer status, status with teacher, and ethnicity are the independent variables. The over-all regression is significant $\left[F = 44.99\ (5,96),\ p < .0001,\ R^2 = .70\right]$, and both Fall '78 reading achievement and status with teacher contribute significantly to the explained variance ($p < .0001$ in each case), but ethnic differences do not (being a Mexican-American approaches significance, with $p < .055$.) This suggests that, while Mexican-American pupils begin the year with lower reading achievement, they at least tend to "obey" the same regression equation as do the others. They may still be at the low end of reading achievement in the next year, and in some sense this gap may be more crucial as one gets older, but at least there is not a significant differential downward shift.

Several items of evidence, then, suggest that when the concept of success in school is expanded to consider concurrent as well as future status, and to examine social status as well as academic status, success in school has no strong, direct relationship to ethnic background. This appears to be true for our population of subjects, at least, where ethnic differences are not compounded by differences in SES or family stability, and we propose that it is a question worth examining for other school populations as well.

Classroom differences in pupil perceptions of teacher praise. Although there are no significant ethnic differences in pupil perceptions of the functions of teacher praise, there are significant classroom differences ($p<.05$), and these data are presented in Table 40. The significance here derives largely from the tendency for pupils of Teacher C not to report praise as deserved, but to see it as serving an instructional function.

The reader will note that few pupils of Teacher A are represented in this table. This stems from the fact that half of the pupils in this classroom had no opportunity to respond to the task on functions of teacher praise. During the lesson with which this task was to be presented, there were no instances of teacher praise, thus we were unable to provide pupils with a set of praise statements that had occurred in the lesson.

The classroom differences that appear in Table 40 are most readily interpretable in terms of the patterns of occurrence of teacher praise, and we turn next to examine these data.

Occurrence of positive feedback in videotaped lessons. The general patterns in teacher use of positive feedback are presented in Table 41. It is interesting to note that the frequencies of occurrence descend in exact order of increase in the presumed strength of the positive feedback. This general pattern is not true for all teachers, however (e.g., A and C)*.

Table 42 presents classroom patterns in occurrence of positive feedback. We note first the rather low frequency of use of any type of positive feedback in the lessons of Teacher A. It is also the case, however, that the bulk of

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* The reader is reminded that Teachers A and C also displayed different patterns in use of questions, according to our sociolinguist's analysis.

Table 40

Classroom Differences in Pupil Perceptions of Functions of Teacher Praise

(N=110)

Reported Function	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Deserved	6	16	10	18	16	16
Instructional or Interactive	2	7	14	6	3	4

$x^2 = 12.21$; df=5; $p < .05$
contingency coefficient = .31

Table 41

Occurrence of Positive Feedback: General Patterns

Type of Feedback	Number of Instances Occurring in 36 lessons	Per Cent of Total Positive Feedback
Repeat Response	453	53.7
Accept Response	162	19.2
Mild Praise	135	16.0
Strong Praise	79	9.4
Extended Praise	14	1.7

Table 42

Occurrence of Positive Feedback: Patterns in Individual Classrooms

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Total Instances Positive Feedback Over Six Lessons	62	158	146	150	164	167
Proportion Repeats	.32	.49	.69	.66	.63	.31
Proportion Accept	.21	.11	.21	.09	.16	.35
Proportion Mild	.19	.18	.05	.10	.18	.29
Proportion Strong	.26	.15	.05	.14	.02	.03
Proportion Extended	.02	.06	.00	.01	.00	.01
Proportion Praise (three types combined)	.47	.39	.10	.25	.20	.33

the feedback that does occur takes the form of actual praise, and that most of the praise is strong, rather than mild.

Teacher C stands out from the other teachers as using the highest proportion of repeats and the lowest proportion of actual praise. Also unlike the other teachers, Teacher C's repeats typically take the form of very slight expansions of pupil statements, rather than verbatim repeats. Her acceptance is usually an "Okay" which serves equally often as a "frame," or indication of transition to a new question. This, then, is the pattern of positive feedback in the classroom where pupil perceptions of the function of teacher praise are markedly different from pupils in other classrooms. Pupil tendencies not to define praise as deserved in this classroom may in fact be close to the mark, for the form of repeat-as-sentence-expansion can readily be interpreted as corrective feedback, rather than positive feedback. Ninety percent of the positive feedback that occurs in this class, therefore, (both repeating and accepting) is somewhat "muddy" in meaning, or open to alternative interpretations.

A third teacher who stands out as rather different in use of positive feedback is Teacher F who, unlike all the other teachers, has almost equal proportions of repeats, acceptance, and praise (.31, .35, and .33 respectively). This teacher's frequent use of mild praise ("That's interesting;" "I like that idea") occurs in the content of lessons which our sociolinguistic specialist has described as "almost conversational in style." In addition to her somewhat distinctive use of positive feedback, Teacher F also stands out as being more effective with regard to pupil reading achievement than Teacher E, her grade level counterpart, as we noted earlier.

In contrast to Teacher F's use of positive feedback, Teacher E uses mostly repeats (.63), and is among the three "lowest" teachers in proportion of actual praise. It is worth reiterating that Teacher F also differs from Teacher E in use of questions, so praise is not the only element of classroom interaction that serves to contrast these two teachers who differ significantly in final reading achievement of their pupils. It is also the case that, while pupils of Teacher F define the function of questions in lessons differently than pupils of Teacher E, the two classes do not differ in their perceptions of the functions of teacher praise (see Table 32). Somewhat cautiously. therefore, we suggest the possibility that Teacher F's different pattern of use of praise and positive feedback, occurring as it does within the context of a rather different conversational style of question-asking and discussion, may relate in some degree to the difference in patterns of pupil reading achievement in the two fourth grades.

Relationships between perceptions of praise and participation in classroom discussions. There are clear relationships ($p<.025$) between pupil perceptions of the functions of teacher praise and pupil patterns of participation in classroom discussion (see Table 43). Pupils who are low in frequency of participation tend to provide no codable function for praise. Pupils who are in the middle in frequency of participation tend to define praise as serving an instructional function. Pupils who are high in frequency of participation tend to define praise as deserved, and are rarely unable to provide a codable function.

Pupil perceptions of praise, participation in class discussions, and success in school. We turn next to examine relationships between our two major classroom discourse variables and success in school, keeping in mind the fact that the discourse variables of perceptions of praise and participation in class discussions are themselves significantly related. Our data show that pupil perceptions of the functions of teacher praise are significantly related to each of the three measures of concurrent status.

Table 43

Pupil Perceptions of Functions of Teacher Praise Compared to Pupil Participation in Discussion

(N=139)

Reported Function	Low Participation	Middle Participation	High Participation
Deserved	26	23	33
Instructional or Interactive	11	16	9
No Codable Function Given	13	6	2

$x^2 = 12.58$; df=4; $p < .025$
contingency coefficient = .29

Table 44 compares pupil perceptions of praise to entering reading achievement ($p < .01$). Pupils below the first quartile of reading achievement tend not to define praise as deserved, and frequently are able to provide no codable function. Pupils above the second quartile reverse this pattern. That is, they do define praise as deserved. Table 45 compares perceptions of teacher praise to pupil status with their peers ($p < .05$). Pupils of low peer status tend not to define praise as deserved, but report instead that it serves an instructional or interactive function. Pupils of high peer status are rarely unable to provide a codable function. In Table 46 perceptions of teacher praise are compared to pupil status with the teacher ($p < .005$). Low status pupils tend not to define praise as deserved, and often give no codable function, while high status pupils tend to reverse this pattern, frequently defining praise as deserved.

Pupil participation in class discussions is significantly related to entering reading achievement (Table 47) and status with teacher (Table 49), but not to status with peers (Table 48). The significant relationship between participation in discussions and entering reading achievement ($p. < .025$) is associated with the tendency of pupils below the first quartile to be low in participation, while pupils above the second quartile tend to be high in participation. The significant relationship between pupil participation in class discussion and pupil status with the teacher ($p < .025$) is largely attributable to the tendency of low status pupils to rank as low participants, while high status pupils rank as high participants. The lack of significant relationship between participation in class discussion and peer status, in comparison with the significant relationship between participation in discussions and status with teachers is rather interesting. This may be at least partially intrepretable in terms of the teacher's role in controlling

Table 44

Pupil Perceptions of Functions of Teacher Praise
Compared to Entering Reading Achievement
(N=133)

Reported Functions	Below First Quartile	Below Second Quartile	Above Second Quartile
Deserved	20	26	32
Instructional or Interactive	16	10	8
No Codable Function Given	14	4	3

$x^2=14.39$; df=4; $p < .01$
contingency coefficient = .31

Table 45

Pupil Perceptions of Functions of Teacher Praise
Compared to Peer Status
(N=120)

Reported Functions	Low Status	Middle Status	High Status
Deserved	16	27	27
Instructional or Interactive	15	7	9
No Codable Function Given	8	9	2

$x^2=11.11$; df=4; $p < .05$
contingency coefficient = .29

Table 46

Pupil Perceptions of Functions of Teacher Praise
Compared to Status with Teacher
(N=137)

Reported Functions	Low Status	Middle Status	High Status
Deserved	16	27	34
Instructional or Interactive	14	14	10
No Codable Function Given	14	4	4

$x^2= 16.33$; df=4; $p < .005$
contingency coefficient = .33

Table 47

Pupil Participation in Class Discussions Compared to Entering Reading Achievement (N=154)

	Below First Quartile	Below Second Quartile	Above Second
High Participation	9	17	25
Middle Participation	21	16	12
Low Participation	25	14	15

$x^2 = 12.96$; df=4; $p < .025$
contingency coefficient = .28

Table 48

Pupil Participation in Class Discussion Compared to Peer Status (N=133)

	Low Status	Middle Status	High Status
High Participation	12	13	16
Middle Participation	14	17	15
Low Participation	20	16	10

Table 49

Pupil Participation in Class Discussion Compared to Status with Teacher (N=150)

	Low Status	Middle Status	High Status
High Participation	11	14	26
Middle Participation	19	17	12
Low Participation	23	16	12

$x^2 = 12.09$; df=4; $p < .025$
contingency coefficient = .27

participation in class discussion, by calling on pupils to take a turn.

The triangular relationship among the variables of pupil perceptions of the functions of teacher praise, pupil participation in class discussions, and pupil concurrent success in school is an important finding in this study, since it points to the type of relationship between status in the social setting, participation in social discourse, and interpretation of the meaning of social discourse, that sociolinguists have long posited.

However, pupil perceptions of the functions of teacher praise do not appear to be directly related to final reading achievement. A regression analysis was performed, with Fall '79 reading achievement as the dependent variable, and Fall '78 reading achievement and categorizations of pupil definitions of the functions of praise as independent variables. The regression was significant $\left[F = 41.67\ (4,105),\ p < .0001,\ R^2 = .614\right]$, but pupil definitions of the functions of praise did not contribute significantly to the explained variance.

Summary. To summarize, in this exploratory analysis of pupil perceptions of teacher praise, we have found that for our particular population:

1) Most pupils perceive teacher praise as occuring because it is deserved, i.e., because pupils have correct or good ideas;

2) This perception is fairly congruent with teacher statements that they use praise for feedback to pupils that their ideas are correct or good;

3) There are no significant ethnic differences in pupil perceptions of the functions of teacher praise, or in pupil participation in class discussions;

4) There are minimal ethnic differences in children's success in school, when the concept of success is expanded to include concurrent success in the classroom social system;

5) There are significant classroom differences in pupil perceptions of teacher praise, and these appear to correspond to classroom differences in teacher use of positive feedback;

6) There is some indication that classroom differences in final reading achievement, when entering reading achievement is controlled for, may correspond to teacher differences in use of positive feedback;

7) There are clear significant relationships among the variables of pupil perceptions of teacher praise, pupil participation in class discussions, and pupil "concurrent success" in school; and

8) There are no direct, significant relationships between pupil perceptions of teacher praise and final reading achievement, when entering reading achievement is controlled for.

Some Speculations on Salience of Teacher Praise

Our basic data collection task, in which pupils responded to the question, "What did you hear anybody saying in that part of the lesson?" was primarily designed to gather information on the length and complexity of the language units that pupils might use in reporting classroom discourse. But as our data collection progressed, we could not help noticing several interesting trends in pupils' differential hearing (reporting) of the language of lessons. The trend of interest here was what appeared to us at first glance to be pupils' tendencies to ignore teacher praise in their reporting of classroom language.

Our initial impressions are quantified in Table 50. The total number of instances of positive feedback reported by pupils (101), in comparison to the total number that occurred (843), tends to support our impression of a rather low frequency of reporting of positive feedback (12 percent of all instances were reported). But more revealing is the highly consistent pattern that as positive feedback increases in intensity (and decreases in frequency of actual occurrence), there is a concommittment increase in the proportion of instances that are reported by pupils as heard. The same pattern holds only in part for the proportions of pupils who report instances of positive feed-

Table 50

Pupil Reporting of Positive Feedback: General Patterns

		Instances Reported As Heard by One or More Pupils		Pupils Reporting One or More Instances (N=137)	
Type of Feedback	Number Instances Occurring	Number of Instances	Per Cent of Instances Occurring	Number of Pupils	Per Cent of Pupils Reporting
Repeats	453	41	9.1	63	46.0
Accept	162	13	8.0	13	9.5
Mild Praise	135	23	17.0	21	15.3
Strong Praise	79	20	25.3	32	23.4
Extended Praise	14	4	28.6	9	6.6
Total	843	101	12.0		

back. Here there is a tendency for more pupils to report the more positive types of feedback where acceptance, mild praise, and strong praise are concerned. But few pupils report extended praise, while almost half of the pupils report instances of teacher repeats of pupil comments.

In search of more understanding of this phenomenon, we have examined patterns of pupil reporting of praise and acceptance in relation to several other variables. There are no significant differences in pupil reporting of praise/acceptance by teacher, by ethnic group, or by pupil perceptions of the functions of teacher praise. When there is no systematic variation to be found, it is difficult to generate compelling interpretations of the data. Perhaps we should have dropped the matter. But the consistent patterns in the types of feedback that were reported suggested that pupils were not really ignoring teacher praise, infrequent though it was.

It occurred to us that praise might be affecting pupils' reporting of classroom language in a somewhat different way. We turned to reexamine the data, by noting the frequency of reporting the pupil comments that drew teacher praise. We compared pupil reporting of all praised comments to their reporting of the last pupil comment made before the praised comment, and to the first pupil comment made after the praised comment. Over all lessons, the mean proportion of pupils reporting the comments that were praised by teachers was .333, while the mean proportion reporting the prior pupil comment was .211, and the mean proportion reporting the following pupil comment was .205. This suggests to us that teacher praise may operate to make pupils more attentive to some of the things that other pupils say. Given the evidence reported earlier that pupils report the comments of other pupils much more frequently than they report teacher question, this appears to be a problem worth pursuing further.

INTERPRETATIONS AND CONCLUSIONS

A variety of specific findings have been detailed in this report, and each section has been summarized to highlight the most important findings. It is time now to put the pieces back together and consider the overall meaning of these findings. To do this, we return to the paradigm which has guided these analyses. Figure 4 presents this paradigm in a revised form. Here the single lines represent relationships among variables which were examined and found to be statistically non-significant, while the double lines represent relationships which are both statistically significant and (we believe) conceptually productive. The dotted lines indicate findings of lack of congruence between perceptions of classroom discourse and discourse at home. We will review each of these types of findings in turn.

The Non-Significance of Family Language Factors

The only family language variable examined in detail in this report is ethnic background. For pupils in this study there are no statistically significant differences between Anglos, Mexican-Americans, and Blacks and other minorities in relation to any of the following variables:

1) perceptions of the functions of questions and responses in family conversations;

2) perceptions of the functions of questions, responses, or praise in classroom lessons;

3) perceptions of congruency in the functions of questions in home and school settings;

4) salience of teacher questions and pupil responses (as apparent in reports of what was heard being said in lessons);

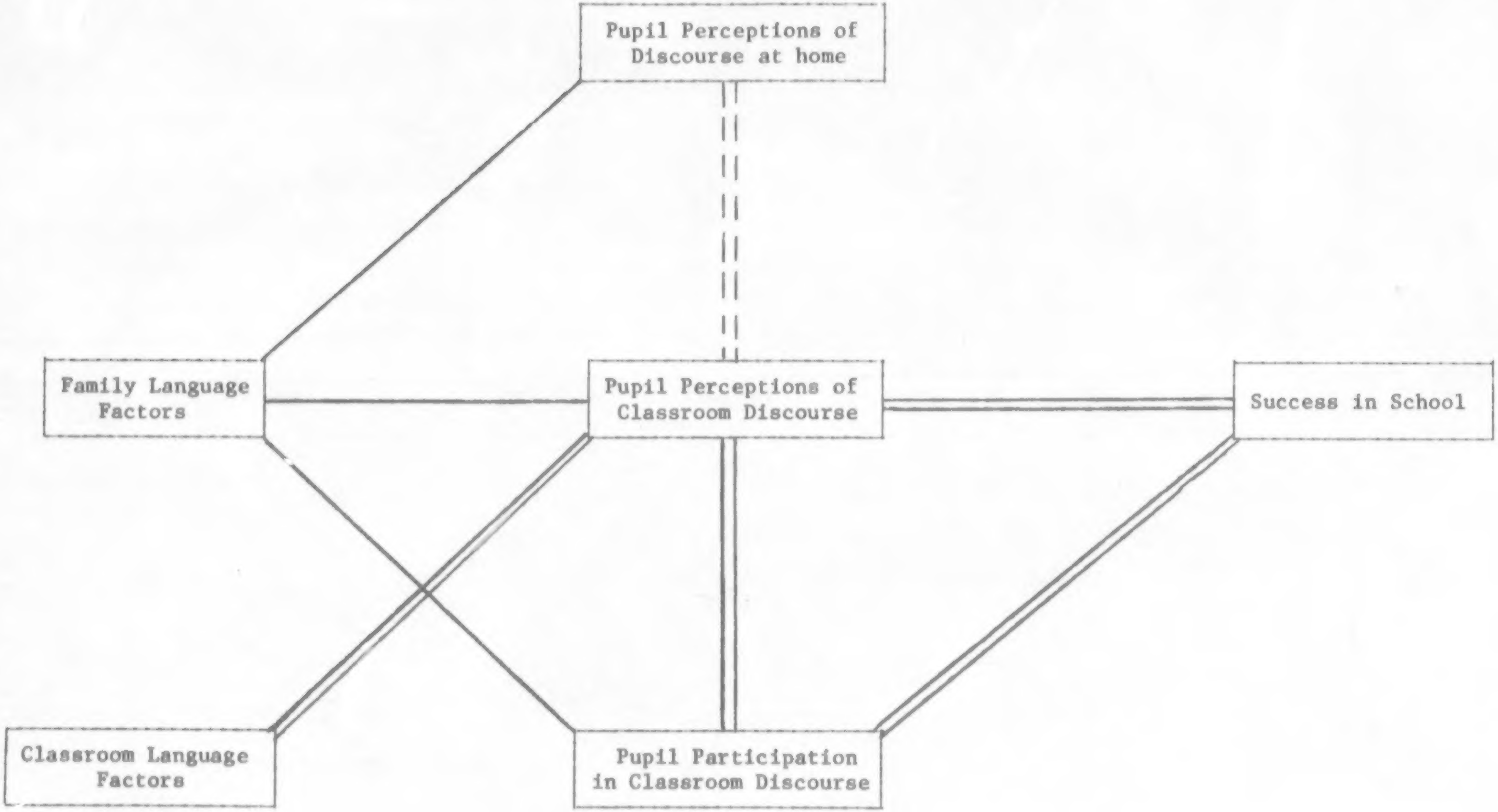
5) frequency of participation in class discussions;

6) status with peers; and

7) status with teacher.

Figure 4

Identified Relationships Among the Variables Studied


Pupil Perceptions of Discourse at home
Family Language Factors
Pupil Perceptions of Classroom Discourse
Success in School
Classroom Language Factors
Pupil Participation in Classroom Discourse

There are significant ethnic differences in entering reading achievement, with Mexican-American pupils displaying lower achievement than either Anglos or Blacks and other minority group children. However, when entering reading achievement is controlled for by use of regression analysis, Mexican-American children are not significantly different from others in final reading achievement (though this closely approaches significance, with $p<.055$).

These findings do not necessarily contradict the assumptions on which this study was based, (i.e., that the culturally different pupil will probably perceive classroom communication from a different perspective than the teacher and other pupils; that the teacher may have negative attitudes about the culturally different pupil's participation in classroom discourse; and that both of these factors may combine to lead to poor school achievement for the culturally different child). In fact, in a rather unexpected way, these findings may support these assumptions.

What appears to be the case for our particular pupil population is that ethnic differences are not compounded by differences in socioeconomic status, family stability, parent interest in school achievement, nor even, for most pupils, by differences in mastery of English. Thus, these Mexican-American children are _not socially, culturally, or linguistically different enough_ from the other children in their school to perceive or participate in classroom discourse in markedly different ways, or to be perceived by their teachers as markedly different. Their evident deficit in entering reading achievement is not reinforced by concomitant deficits in status with peers or status with teacher, and they do not fall significantly further behind in reading as the school year progresses.

What these findings demonstrate is that ethnic (cultural) difference, in and of itself, does not (need not) lead automatically to school failure.

What they suggest is that we need to examine in much greater detail the interaction of cultural differences with socioeconomic and other differences in family background, as these relate to school achievement deficits.

The importance of considering pupil status with the teacher, as both a measure of, and a contributor to, success in school is also apparent from these results. It was reported earlier that: 1) status with teacher contributes significantly to the explained variance in final reading achievement (with entering reading achievement controlled for); and 2) status with teacher is also significantly associated with frequency of pupil participation in class discussions, which in turn contributes significantly to explained variance in final reading achievement. These facts highlight the complexity of the possible effects of teacher attitudes toward pupils.

But teacher attitudes were not significantly related to ethnic background of pupils in this study, so clearly they did not stem simply from teacher stereotypes about the various cultural groups represented here. As reported earlier both peer status and relative rank in reading contribute significantly to the explained variance in status with teacher. This suggests to us that teacher attitudes have some basis in the real social and academic abilities/behaviors of the child. Thus, in a school and community setting where multiethnic groups interact as equals (i.e., behave as equals), teachers may be more apt to be minimally influenced by ethnic differences in forming judgments about pupils.

The complexities of relationships among the various pupil status variables considered here are obvious, and we plan to explore these in much greater detail in a subsequent report. For now, it is important to note that these findings regarding the non-significance of family language factors (ethnic background) are undoubtedly related to some of the unique (and, we feel, positive) characteristics of our particular school population. We would not expect to see these findings replicated in very different settings (e.g., a bilingual class, or with pupils whose parents are migrant workers).

Classroom Language Factors and Pupil Perceptions of Classroom Discourse

The relationships between classroom language factors and pupil perceptions of classroom discourse reported here lead us to draw two major conclusions. The first is that while most pupils have learned the typical classroom functions of teacher questions and teacher praise by second grade, and in addition are aware of the difference when certain teachers use questions or praise to serve less typical functions, an understanding of the functions of pupil responses apparently takes longer to develop. The second conclusion is that while teachers and pupils exhibit a basic agreement about the functions of and the salience of questions, responses, and praise in lessons, their perceptions are different from those of the outside observer in some rather interesting ways.

To explore this second conclusion further, we note that almost half of the pupils who gave a codable definition of the function of teacher questions thought they were asked because the teacher wanted to tell or teach, while less than 10 percent saw them as serving probing function. The teachers identified questions as serving informative and routine interactive functions more frequently than did the pupils, but they concurred with pupils in rarely mentioning a probing function. Our sociolinguistic specialist, Roger Shuy, in contrast, while he notes that in many instances the question form served a directive function, chooses to concentrate on an exploration of the probing function, which in his view is the most appropriate function for classroom questions. It is clear from his analysis that the types of questions used and the sequences in which they occur in these classrooms are not well designed to serve this probing function. In a sense, then, the teacher and pupil participants and the outside observer all agree that the questions asked by teachers in these lessons do not generally serve a probing function (at least, not effectively). They disagree in that the outside observer seems to assume that probing *ought* to be the most important function (an assumption which, it can be argued, has a great deal of merit), while neither teachers nor pupils appear to make this assumption.

The supposed value of the method of "triangulation" that we have used in this study is that the juxtaposition of several different perspectives may result in the creation of a new, clearer, and more encompassing vision of the phenomenon under study. In this instance, the juxtaposition of views leads us to ask whether the somewhat unexpected (from the point of view of the outside observer, at least) perceptions of pupils that *teachers questions are asked in order to give information* (to tell or teach), rather than to *get* information, a perception which is shared to some degree by teachers, is in any way coherent with pupils' other perceptions of classroom discourse.

The other pupil perception which is most surprising, and which clearly differs from the perspective of most of the outside observers who have been studying classroom interaction for the past fifteen years (e.g., Flanders, 1970; Bellack, 1966), but which is also apparently shared by teachers in this study is that *pupil responses are more salient* (attended to more often and/or deemed more important to report as being heard) *than teacher questions*. Some additional, less surprising, predominant pupil perceptions which have been discussed in this report, and which appear to have relevance to this question, are:

1) that pupil responses are given because the teacher asked a question;

2) that praise is given because the pupils' responses are right, or good; and

3) that praised responses are more salient than unpraised responses.

How might these perceptions be integrated with the view that teacher questions are asked in order to tell? We suggest that the threads might be woven together in pupils' minds (consciously or unconsciously) in the following way. Teacher questions serve to identify the things that one ought to know. Pupils respond to these questions because that is the "natural" course of events--a question is asked, an answer is given. The answers to questions inform other pupils, so that if one pupil knows what ought to be known, soon all pupils may know it. It is the pupil responses, therefore, that one must attend to, in order to know what should be known. When a pupil response is right it is praised, as indeed it should be, for not only does this response demonstrate that the one pupil knows what ought to be known, it informs all other pupils, correctly, so that they now know as well (or so that they are confirmed in what they thought to be correct). A pupil response which is praised is probably a better (more accurate) presentation of information than one which is not praised (although an unpraised comment may not really be wrong), so it is probably useful for other pupils to make a special note of comments which draw teacher praise.

This vision of "the way it works" does fit pupil descriptions of the functions of questions, responses, and praise. What is more, it fits teacher explanations of the functions of these basic elements of classroom discourse, for teachers reported that their questions were asked "to teach," or "to get an answer," that pupil responses were given "because a question had been asked," and that praise was given because they wanted pupils to "know the answer was right." It seems possible, then, that teachers and pupils share a common understanding of the function of the solicit-response-react cycle as an integrated unit that contributes to learning in classrooms.

The integrated conception hypothesized above is in sharp contrast to a perception of questions as serving a probing function, the perception that was proposed by our sociolinguistic specialist. But one need not negate the other. Surely at some point teachers need to diagnose what pupils know. When this point is reached the question as probe needs to be skillfully used, and, presumably, pupils need to be aware that the purpose of the teacher's questioning has shifted from "teaching" to "testing."

What this analysis of participant perceptions would seem to reveal is that teacher questions, and the solicit-response-react cycle, may serve a variety of functions. The function (e.g., probing) which stands out as most typical and appropriate to the outside observer (or, alternatively, as most inappropriate, for many sociolinguists decry the existence of the "psuedo-question" in classroom dialogue) may not be the function which stands out as most typical and appropriate to the participants in classroom discourse. Moreover, the function which is deemed typical and appropriate in most classrooms may not be the function that is typical in all classrooms (e.g., Teacher F's conversational use of questions as informatives, to learn more about pupil experiences and relate these to the content of the lesson; or Teacher A's and Teacher C's managerial use of questions as directives, to control the flow of classroom interaction). There are clearly many ways of using and of perceiving classroom questions. But if sociolinguists are right, we cannot fully understand classroom language, in either the general or the particular classroom, without understanding the ways it is perceived by the classroom participants, for it is these perceptions that guide their behavior.

We propose that the integrated conception of the classroom question cycle outlined above, and "revealed" by the responses of both pupils and teachers to a variety of data collection tasks, is one worth investigating further. We suggest, for example, that this conception can throw new light on studies of the effectiveness of "direct instruction" (Rosenshine, 1979). These studies emphasize the effectiveness of a classroom question cycle in which the teacher asks factual questions at a level of difficulty that insures a high proportion of correct responses, and provides praise and corrective feedback as appropriate. This version of a question cycle is remarkably well suited to serve the integrated functions of questions, responses, and praise conceptualized here.

But teacher effectiveness is another issue, and to consider it more fully, we must examine relationships between classroom discourse variables and success in school.

Classroom Discourse Variables and Success in School

The relationships reported here between the two main classroom discourse variables (pupil perceptions of classroom discourse and pupil participation in classroom discourse), and between each of these variables and the variable of success in school are readily interpretable in terms of (and supportive of) the sociolinguists' concept that an interactive relationship exists among one's status in the social setting, one's participation in social discourse in that setting, and one's interpretation of the meaning of that social discourse. This is clearly the case for pupils in this study.

Pupils who perceived classroom questions as informative, and pupils who identified teacher praise as deserved, tended to participate more frequently in class discussions. Pupils who participated more frequently in class discussions tended to have high concurrent status with regard to entering reading achievement and status with teacher (but not with regard to peer status). Pupils who participated more frequently in class discussions also tended to be higher in final reading achievement, when entering reading achievement was controlled for. Pupils who could not define the functions of teacher questions tended to have low composite concurrent status, while those who defined questions as instructional had high composite concurrent status. Pupils who were high in concurrent status with regard to entering reading achievement tended to see teacher questions as more salient than those who were low in entering reading. Pupils who were high in concurrent status with regard to peer status tended to see pupil responses as more salient than those who were low in peer status. While there were no direct relationships between pupil perceptions of the functions of questions, responses, or praise and final reading achievement (when entering reading achievement was controlled for) there appeared to be indirect relationships, for these variables were related to frequency of participation in class discussion, which was in turn related to final reading achievement.

It is important to note, however, that these possible indirect relationships (perception of discourse relates to participation in discourse, which relates to final reading status) are by no means clear and simple. The findings suggest that pupils who attain relatively high concurrent classroom status are more "tuned in" to the typical functions of questions, responses, and praise in lessons (and may even have the integrated conception of the question cycle discussed in the foregoing section). However, understanding the typical function of questions and responses appears not to contribute either directly to final reading achievement, or indirectly through frequency of participation in class discussions. It is the pupils who perceive questions as serving an informative function (i.e., a function more similar to that in normal conversations) who participate more frequently in discussions. And the high peer status pupils, who attend most carefully to the responses of other pupils, do not participate any more frequently in discussions than low peer status pupils. Only an understanding of the typical function of praise appears to contribute strongly to frequency of participation in class discussions, and thus, perhaps, to final reading achievement.

How then might perceptions of classroom discourse contribute to final reading achievement? This appears to occur at the classroom level of analysis, rather than at the pupil level. We have reported that there were classroom differences in final reading achievement (Teacher F more effective than Teacher E), and that these differences corresponded with differences in pupil perceptions of classroom questions, and with differences in teacher use of questions and praise. These two fourth grade teachers were, in fact, contrasted along a variety of lines, and were perceived as different not only by the pupils in their classrooms, but also by outside observers (our sociolinguistic specialist, and the classroom interaction analyst who coded patterns of teacher praise).

Teacher F used questions to serve an informative function, as part of a natural conversational style, gathering information about pupils' own experiences, then relating these to the concept being taught. Teacher E used questions to serve a highly instructional function, involving a "horizontal" flow, where a series of responses were given to the same question, and the information provided by these was never summarized. Teacher F reacted to pupil responses with acceptance and praise twice as often as with repetition of the response, while Teacher E reversed this pattern. (It is also the case that while both these teachers focused strongly on pupil responses in their reporting of what they heard in lessons, Teacher F reported correct responses to questions, while Teacher E focused on incorrect responses. This finding is discussed in more detail in Part I of this final report.)

These findings suggest that pupils tend to perceive classroom discourse as it exists in reality, and that certain patterns of classroom discourse may be more conducive to learning than others. The less effective pattern described here (Teacher E's classroom) might be seen as involving the overuse of a short-circuited question cycle, which is otherwise roughly similar to the hypothesized integrated pupil conception of the "typical" cycle, presented in the previous section. That is, Teacher E asks questions in order to teach, and these questions identify knowledge that she apparently thinks it is important to have. But rather than getting one, two, or three responses to these questions, and identifying the most appropriate response (the one pupils should remember) through praise or corrective feedback, she gathers long strings of responses, repeating most of them, and rarely identifying any as more correct or appropriate. Thus, pupils are left at a loss in their attempts to use (learn from) the responses of other pupils.

The more effective pattern (Teacher F's classroom) can be seen as involving some use of the typical classroom question cycle, but supplementing or enriching this with a consistent use of a questioning style that is quite similar to that which appears in natural conversations. Thus, pupils in this class find classroom discourse to be somewhat congruent with discourse at home, and their learning appears to be enhanced.

This brings us to consideration of the findings pertaining to relationships between classroom discourse and discourse at home.

The Incongruency of Home and Classroom Discourse

It is clear from our findings that the pupils in this study were very aware of the real differences in the functions of questions in lessons and questions in family conversations. Teachers asked questions because they wanted to teach or tell. Parents asked questions because they wanted to know. In addition, while responses in both settings were reported to serve a Routine Interactive function, this was phrased in rather different ways. Children responded in lessons because the teacher asked a question. They responded in family conversations because they were "just telling" someone something.

The numbers of pupils who reported congruency in the functions of either questions or responses was quite small (12.9 percent for questions and 16.8 percent for responses). One might believe that a sense of such congruency should be related to school achievement, but in fact this is not the case. Except for the pupils in Teacher F's class, a pupil perception of congruency of functions would have been in error, and would have demonstrated either that the pupil misperceived the "real" function of the question cycle in the classroom, or that conversations in the pupil's family were very formal and academic.

The perception of incongruency was widespread among pupils (over 75 percent of pupils reported incongruency for questions, over 69 percent for responses). Pupils high in the concurrent status variables shared this perception about equally with pupils low in the concurrent status variables. Thus, the accurate perception that discourse in the two settings was not congruent did not appear to contribute to pupil success in school.

What these findings demonstrate is that second, third, and fourth grade pupils as a group can display more communicative competency (i.e., more awareness of the fact that discourse processes vary from one social setting to another) than we might have anticipated. Most of these pupils did not appear to be at all confused by the differences between classroom discourse and discourse at home.

One question that may deserve further investigation has to do with pupils who could not provide a codable function for questions or responses in either setting. It seems reasonable to suspect that these pupils lack communicative competence to a degree that could affect their interaction in both settings, and this might be reflected in school achievement. While the numbers of pupils in this category were quite small in our study (7 pupils gave no function for either questions or responses in either setting, 10 gave no function for questions in either setting, 9 gave no function for responses in either setting), 74 percent of these pupils scored below the second quartile in reading achievement. They were distributed quite evenly on the basis of ethnicity, peer status, and status with teacher, however. We suggest that this is a problem worth pursuing further.

Conclusion

In conclusion, it is important to reiterate that the data presented here resulted from an in-depth study of six classrooms in a single school. While our findings are not generalizable, we believe that they are revealing of some interesting and potentially productive concepts and questions for future research. Particularly, we urge that future studies of teacher effectiveness should take into account the concurrent status variables identified here, as well as final achievement. Further, we urge that future investigations of classroom interaction utilize the variables of classroom status, participation in classroom discourse, and interpretations of classroom discourse in order to understand more fully the effects of various patterns of interaction.

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APPENDICES

I. Data Collection Tasks

A. Functions of Questions, Responses, and Praise

1. October/November lessons.

A set of examples of teacher questions asked in the lesson were selected and written on 3 x 5 cards prior to meeting with pupils. For example, one set of teacher questions selected was:

What does "description" mean?
Who can tell me one thing that a witch looks like?
Do you want me to tell the color of her hair?
What's that bump called?

A second set of examples of pupil statements (answers to questions) made in the lesson were also selected and written on 3 x 5 cards. For example, the accompanying set of pupil statements for the above questions was:

That means if you see something about the witch, to describe it.
She has green, ugly hair.
She has a pointed nose, and a bump on her nose.
A wart.
Ugly.

(Lay out each set of "function" cards in turn, and ask the following questions.)

Here are some things that I heard people saying in the lesson. I think these things kind of belong together. Can you guess why I put these together? (Write down response.)

That's a pretty good guess. You know, I have an idea that when someone says something, they usually have a reason for saying it, and I thought that maybe all these things were said for the same kind of reason.

Who do you suppose said these things? . . . Do you think it was the teacher who said these, or pupils who said them? (Write down response.)

Who do you suppose they were talking to when they said all these things? (Write down response.)

If my idea were right, and all these things were said for the same kind of reason, what reason do you suppose the teacher (or pupils) had for saying these things? (Write down response.)

Look here at these cards of things you heard people saying in the lesson. Can you find any cards where someone said something to (restate reason given by pupil in response to preceeding question)? (Mark all cards selected.)

For teacher questions, end with the following.
Do you ever say things like this in a lesson? (If "yes", ask "When?" and "What?" If "no", ask "Why not?" Write down response.)

For pupil statements set, end with the following.
Does the teacher ever say things like this in a lesson? (If "yes", ask "When?" and "What?". If "no", ask "Why not?" Write down response.)

2. December/January lessons.

(Same as for October/November, except that the selected set consisted of instances of teacher approval or praise given in the lesson. For example, one set of teacher praise statements was:

That's good.
Wow!
All of these are very good.

3. Family Conversations.

[A set of questions asked and a set of statements made in the family videotape were selected. For each set the following questions were asked.]

Here are some things that I heard people saying in the family conversations. I think these things kind of belong together. Can you guess why I put them together? (Write down response.)

That's a pretty good guess. Well, I thought maybe these things were all said for the same kind of reason. Who do you suppose said these things, do you think they were said by kids, or by parents? (Write down response.)

Who do you suppose they were talking to? (Write down response.)

If these things were all said for the same kind of reason, what do you suppose that reason was? Why do you think they said all these things? (Write down response.)

Look here at these cards of things that you heard being said in the family conversations. Can you find any of your cards that you think were said for the same reason? (Restate reason given by pupil. Write down response.)

Do you ever say things like this at home? ______________________
______________ If "yes", "When?" "What?" If "no", "Why not?"

Does your mother ever say things like this?
Does your father ever say things like this?

B. Pupil Status with Teacher

In September, October, and December, each teacher was presented with a set of 3x5 cards, each card containing the name of a pupil in the class, and asked: "On the basis of what you've observed so far, can you group these pupils according to their similarities and differences in listening attentively in class?" When pupils had been grouped, the teacher was asked for each group: "How are the pupils in this group similar?" The same procedure was repeated for each of the following aspects of communicative behavior: participation in classroom discussion; observance of "no talking" rules, and use of standard English. The teacher was then asked: "Can you think of some other aspect of pupils' use of language in the classroom that you might use to differentiate and group pupils?" Finally, the teacher was asked: "Can you group pupils according to your predictions for their success in reading this year? Which pupils do you think will be the most successful and the least successful?"

Teacher responses in the December interview, when pupils were known, were used to compile a composite rating, and pupils were ranked on the basis of this overall rating, to identify status with teacher.

C. Pupil Status with Peers

1. Procedures for administering status perception instrument

a) Children will be interviewed individually.
When children enter Language Lab they should sit with an interviewer familiar to them, if possible.

b) To introduce SPI tell child we want to learn more about their class and will be asking some questions they will answer by choosing people from the picture board. Show the child the picture board. Ask if the pictures are from their class. Have the child find his/her picture and point to it.

c) Ask questions in the order they appear on the forms. Have the children point to pictures as they answer. Use the exact wording. If child gives a name, check it with the back of picture. Write down both first and last name in space provided. Record in the order given.

2. Questions Asked of Pupils

a) Suppose there is going to be a sports contest between your class and Mrs. ______________________'s class.

abc Which three people would you choose to make sure your class would win?

def Which three people would have to work hardest in order to be on the team?

b) Suppose your class got a chance to be on a TV Quiz Show playing against ____________________ grade from another school. Your class has to send a team of three people and they will be asked questions about things learned in school.

abc	Which three people would you choose to be [illegible] class team in order for your class to win?	def	Which three people would have to study hardest if they wanted to make the team?

c) Suppose your teacher had to leave the classroom.

abc	Who would she most likely leave in charge? (if absent, who? Repeat).	def	Who would she least likely leave in charge? Who else? Who else?

d) Suppose an accident happened in your class and no grown-up was around?

abc	Which person would most likely take charge and know what to do? (If absent, who? Repeat).	def	Which person would be least likely to take charge and know what to do in an emergency?

e) Suppose your teacher had an important message to send to the office.

abc	Who would she most likely choose to take the message? (If absent, who? Repeat).	def	Who would the teacher least likely choose to take the message? Who else? Who else?

f) Suppose my job was to follow you around for a week and make a list of the people in your class you were hanging around with.

abc	Who would most likely be at the top of the list. Who next? Who next?	def	Who would least likely be on the list? Who else? Who else?

g) Suppose a photographer came around and he wanted the photograph of some kids on the cover of a book for children. The photographer doesn't know any of the kids. He just walks around for a while. He opens the door of your class, pokes his head in, and looks at the children in the class for just a minute and then closes the door. If we had to decide right then,

abc	Who would he most likely chose to photograph for the book cover? Who else? Who else?	def	Who would he least likely choose to photograph for the book cover? Who else?

3. In identifying pupil status with peers, only responses to questions a, b, d, and f were used. A composite rating reflecting all choices and rejections was computed, and pupils were ranked with their class on the basis of this figure.

II. Examples of Classroom Language Used in Functions Task

A. Teacher A - second grade

1. October lesson (Reading cat stories)

Questions:

What is the surprise that we're having?
Who knows what we're making for our mothers?
How many cat stories will they get to read?

Responses:

We're having a Halloween party.
A cat story.
A monster.

2. November lesson (Praticing Thanksgiving play)

Questions:

Does anybody have something that they want to tell everybody else?
Who knows what color pants the Pilgrims wore?
Why didn't they wear red pants?
Why do we need to practice this?

Responses:

So we'll know it.
To make sure you talk loud so everybody can hear you.
Remember to hold your picture and don't put it over your face.
Because they didn't have that kind of thing...

3. December lesson (Sharing Time)

Praise:

(there were no instances available.)

4. January lesson (A story about Abraham Lincoln)

I like that.
Good.
O.K.
All right.

B. Teacher B - third grade

1. October lesson ("Concept formation" lesson)

Questions:

Do you want to explain what you did?
What group should I put "pizza" in?
What does it mean to group?
Can you think of another way to put these together?

Responses:

I put the red ones together because they're small.
I put all the blue ones together.
I put squares, and circles, and triangles.
Cars.

2. November lesson ("Synectics" lesson- i.e., analogical comparisons)

Questions:

How are M'Beta and Melanie alike?
How is a turkey like a person?
What are yams?
How are cranberries like roses?

Responses:

They're red.
They're sweet potatoes.
It can walk.
They're both people.

3. December lesson ("Inquiry" lesson - how to ask careful questions)

Praise:

That's good, David.
That was a good question.
Many of you asked very good questions.
That's a much better question.

4. January lesson (The origin of names)

Praise:

Good.
Very good.
That's a good one.
All right.

C. Teacher C - third grade

1. October lesson ("Synectics" lesson)

Questions:

How is a balloon like a tree?
How would you feel if you were a balloon?
If you were a shoe, how would you look?
A seed and a shoe - how are they alike?

Responses:

Shoes can be pointed, and also seeds can be pointed.
If you trim a tree and it's kind of a round shape, so is a balloon.
You would feel sad when you popped.
Stuffed.

2. November Lesson ("Inquiry" lesson)

Questions:

Can you tell me one thing we found out about this thing?
Does it matter about the color?
What do we fix with it?

Responses:

It's long.
Our hair.
You can wear it.

3. December lesson (Textbook: communication)

Praise:

Very good.
Okay.
All right.
Okay. Right!

4. January lesson (Textbook: Nouns)

All right.
Okay.
Yes, that's a noun.

D. Teacher D - Third grade

1. October lesson (Describing and drawing a witch)

Questions:

Who can tell me one thing that a witch looks like?
Do you want me to tell the color of her hair?
What does description mean?
What's that bump called?

Responses:

Ugly.
She has green, ugly hair.
A wart.
She had a pointed nose, and a bump on her nose.
That means if you see something about the witch, to describe it.

2. November lesson (Describing sensory awareness)

Questions:

Do you have anything you want to add about celery?
Can anybody else tell us about this thing that's in front of them?
If I said the word sun, what could you tell me about the sun?

Responses:

It's bright.
It's yellow.
It snaps.
It's round.
Keep it cold.

3. December lesson (Imaginary things)

Praise:

That's good.
Wow!
Oh, wow!
All of these things are very good.

4. January lesson (Review of nouns)

Praise:

Very good.
Ah! Good!
All these are good answers.
Okay.

E. Teacher E - fourth grade

1. October lesson (Creative writing: "The Haunted House")

Questions:

Do you remember what I said we have to do before we begin to write?
Before you even write a thing on your paper, your first job is to--what?
What should you do when it's all done?
How are you going to know when your story is finished?

Responses:

I slapped a ghost and he slapped me back.
Miss E______, my young cousin, every time she saw a monster coming, she put her head on her mother's shoulder, and she started shaking.

Miss E_______, they videotaped me and Ricky with the lights on.

2. November lesson (Reading cartoon strips they made up)

Questions:

And we said that these little circles, pointing to people, tell us what?
Where would you see cartoons like this, beside the newspapers?
These pictures reminded us of what?

Responses:

In a comic book.
Cartoons.
What they're saying.
Who's talking.

3. December lesson (Textbook: Poetry interpretation)

Praise:

That would be a good place.
That would make sense, too.
Oh, that would be a good idea, wouldn't it?
That could be a good reason.

4. January lesson (Textbook: Poetry interpretation)

Praise:

Right.
All right.
Okay.
Good.

F. Teacher F - fourth grade

1. October lesson (Textbook: Poem on Embarrasing Experiences)

Questions:

How did you feel when you went to tell somebody what happened to you?
What did it taste like?
Have you accidentally every swallowed anything?
Do you think that was a funny one?

Responses:

He was telling you about what he accidentally swallowed.
Last night I swallowed some dust, and it was terrible.
Dirt.
I swallowed five little bugs.

2. November lesson (Textbook: Commands and Statements)

   Questions:

   In the morning when you get up, what are all the things you do?
   What's the first thing you do?
   How did you ever learn what to do?
   Does anybody tell you what to do?

   Responses:

   Eat breakfast.
   Get dressed.
   Get out of bed.
   From watching other people.
   I put my clothes on my bunk bed, I get dressed on my bunk.

3. December lesson (Textbook: Poetry interpretation)

   Praise:

   All right. Good.
   That was a good one.
   Good. That's a pretty good job.
   That's a good thought.

4. January lesson (Textbook: Compound words)

   Praise:

   Good girl.
   All right.
   Good.
   I like that one.

III. Category System Developed to Code Response to Function Task - Illustrative Examples

A. Questions

1. Teacher wants to know
   - a. She wants to know how you would feel.
   - b. She wants to know what a witch is like.
   - c. She knows we say things different and she wants to know what we'll say.
2. Teacher wants pupils to think
   - a. To see if we could think harder.
   - b. For us to think about what we have to do.

3. Teacher wants to tell/teach
    - a. To teach.
    - b. So we'll know what to do.
    - c. To make us understand.

4. Teacher wants to know if pupils know
    - a. To find out if we knew what to do.
    - b. To know who knows what we're making.

5. Teacher wants to get an answer (ask a question)
    - a. She wanted answers.
    - b. To give us the question.
    - c. She wanted us to answer them.

6. "That's just what we're doing"
    - a. 'Cause we're gonna have a party and we're making monsters.
    - b. 'Cause we're making a witch.
    - c. It was in our lesson.

7. Other, unique responses
    - a. For fun.
    - b. Question marks are used.
    - c. So we won't bother her.

B. Responses

1. Pupil wants teacher to know
    - a. To tell her what happened.
    - b. They wanted her to know about the Haunted House.
    - c. To tell Miss B. those things.

2. Pupil wants other pupils to know
    - a. To tell the class what happened.
    - b. So the kids would know.

3. Pupil wants to learn
    - a. To think harder.
    - b. To be smarter.
    - c. They're seeing if they're right.

4. Pupil wants teacher to know they know
    - a. To tell her they know.
    - b. To show her they know about a witch.

5. Teacher asked a question (to answer)
    - a. Mrs. C. asked the question.
    - b. Miss A. asked them.
    - c. To answer her.

7. Other, unique responses
    a. To add things to the blackboard.
    b. They raised their hand.

C. Praise

1. Because pupils had the right/good idea
    a. 'Cause the answers were good.
    b. They were saying good words.
    c. Because people were saying good things.
2. Teacher wants pupils to learn
    a. So we can know how to say mental pictures.
3. Teacher wants pupils to feel good
    a. She wanted them to feel happy.
    b. To make them feel good.
4. Teacher wants pupils to know it was right/good idea
    a. Telling children those were good things they thought of.
    b. Trying to show us we can do it.
5. Because pupils participated
    a. They said an idea.
6. Teacher wanted to get pupils' attention
    a. So they'd listen.
7. Other, unique responses
    a. We were having fun.

IV. Additional Information on Statistical Analyses

A. Procedures

The following types of procedures were used for transformation of measures for use in regression analyses and/or for comparison over classrooms.)

1. Relative rank in reading (Relrank)

RRIC = number of students in pupil's class with a Fall '78 reading score lower than theirs.

Relrank = RRIC/total number pupils in class.

2. Pupil status with teacher (STATWT)

This composite variable is a function of teacher ratings on: LA (listening attentively), PICD (participation in class discussions), NTR (following the "no talking" rules), USE (use of standard English), and PSR (predicted success in reading).

Teachers rated these items on a scale of 1 to 4 (or more, if teachers formed more groups).

For pupil i in Teacher 1's class, to compute LA, for example:

$$LA_i = \frac{Y_{1i} - \bar{Y}_1}{\sqrt{n}\sqrt{\frac{\sum (Y_{1i} - \bar{Y}_1)^2}{n-1}}}$$

where n = class size; Y_{1i} = ranking on LA, $\bar{Y}_1$ = average ranking on LA in Teacher 1's class. Similarly, compute RICDi , NTRi , USEi , and RSRi , and define STATWT = LAi + PICDi + NTRi + USEi + PSRi . Now except for the inadvertent $\frac{1}{\sqrt{n}}$ factor this is the sum of the "standardized" variables. The five scales that make up STATWT are ordinal, so the use of means and standard deviations is a bit suspect, still this procedure is often done (see Nie, et al, SPSS manual, McGraw-Hill, 1975, pg. 185).

Then, STATWTM = STATWT x $\sqrt{\text{class size}}$ (to remove the relevant inadvertent $\frac{1}{\sqrt{n}}$ factor)

and, NSTATWT = -1 x STATWTM (this simply make it easier to interpret the status with teacher variable, by making larger values mean more status.)

3. Frequency of participation in class discussion (FCD)

Note that $0 \leq$ FCD.
RFCD = relative frequency of class discussion

for pupil j,
$$RFCD = FCD_j / \sum_j FCD_j$$

where $\sum_j FCD_j$ is the total number of pupil comments made in pupil j's class. $0 \leq RFCD \leq 1$.

TRANRFCD = transformed relative frequency of class discussion.

TRANRFCD = -1*log (1-RFCD)

Therefore, as RFCD increases, 1-RFCD approaches zero, the log (1-RFCD) gets large and negative, so -1 x log (1-RFCD) gets large and positive.

Note: A more often employed logit transformation cannot be used because in the expression, -1 x log [(1-RFCD)/RFCD] . the value of RFCD is sometimes zero, and division by zero is not defined.

B. Regression Analysis Tables

References were made in the report to several regression analyses. Tables for these are presented on the following page.

Table I

Analysis of Reading Achievement, Fall '79
(Classroom Discourse Variables)

Source	Sum of Squares	D.F.	Mean Square	F
Fall Reading '78	6513.63	1	6513.63	162.48
Information Load	25.64	1	25.64	.64
Transformed Relative Frequency Class Discussion	772.35	1	772.35	19.27
Error	4129.26	103	40.09	

Table II

Analysis of Reading Achievement, Fall '79
(Teacher and Classroom Discourse Variable)

Source	Sum of Squares	D.F.	Mean Square	F
Teacher F	521.29	1	521.29	14.88
Teacher D	152.95	1	152.95	4.37
Teacher E	354.71	1	354.71	10.13
Teacher B	8.30	1	8.30	.24
Teacher C	1.72	1	1.72	.05
Fall Reading '78	6284.25	1	6284.25	179.39
Information Load	21.27	1	21.27	.61
Transormed Relative Frequency of Class Discussion	563.35	1	563.35	18.94
Error	3433.03	98	34.03	

Table III

Analysis of Reading Achievement, Fall '79
(Pupil Status Variables)

Source	Sum of Squares	D.F.	Mean Square	F
Fall Reading '78	6446.62	1	6446.62	193.02
Peer Status	260.36	1	260.36	7.80
Status with Teacher	646.45	1	646.45	19.36
Mexican-American	82.30	1	82.30	2.46
Black & Other Minorities	76.72	1	76.72	2.30
Error	3206.30	96	33.40	

Table IV

Analysis of Reading Achievement, Fall '79
(Reported Functions of Questions and Responses)

Source	Sum of Squares	D.F.	Mean Square	F
Fall Reading '78	8523.45	1	8523.45	163.43
Qs-Informative	3.36	1	3.36	.06
Qs-Instructional	7.66	1	7.66	.15
Qs-Routine Interactive	.01	1	.01	.00
Resp-Informative	1.07	1	1.07	.02
Resp-Instructional	53.60	1	53.60	1.03
Resp-Routine Interactive	9.40	1	9.40	.18
Error	5945.55	114	52.15	

Table V

Analysis of Reading Achievement, Fall '79
(Reported Functions of Praise)

Source	Sum of Squares	D.F.	Mean Square	F
Fall Reading '78	7080.14	1	7080.14	165.34
Deserved	39.66	1	39.66	.93
Instructional	17.67	1	17.67	.41
Routine Interactive	.96	1	.96	.02
Error	4496.34	105	42.82	

Table VI

Pupil Status with Teacher

Source	Sum of Squares	D.F.	Mean Square	F
Peer Status	240.53	1	240.53	17.42
Relative Rank in Reading	169.60	1	169.60	12.28
Mexican-American	1.74	1	1.74	.13
Black	.74	1	.74	.05
Other Minorities	.40	1	.40	.03
Error	1629.69	118	13.81	

Table VII

Pupil Status with Teacher

Source	Sum of Squares	D.F.	Mean Square	F
Pupil Predictions of Status with Teacher	285.52	1	285.52	21.19
Relative Rank in Reading	174.82	1	174.82	12.97
Mexican-American	2.46	1	2.46	.18
Black	2.19	1	2.19	.16
Other Minorities	1.01	1	1.01	.07
Error	1576.67	117	12.48	